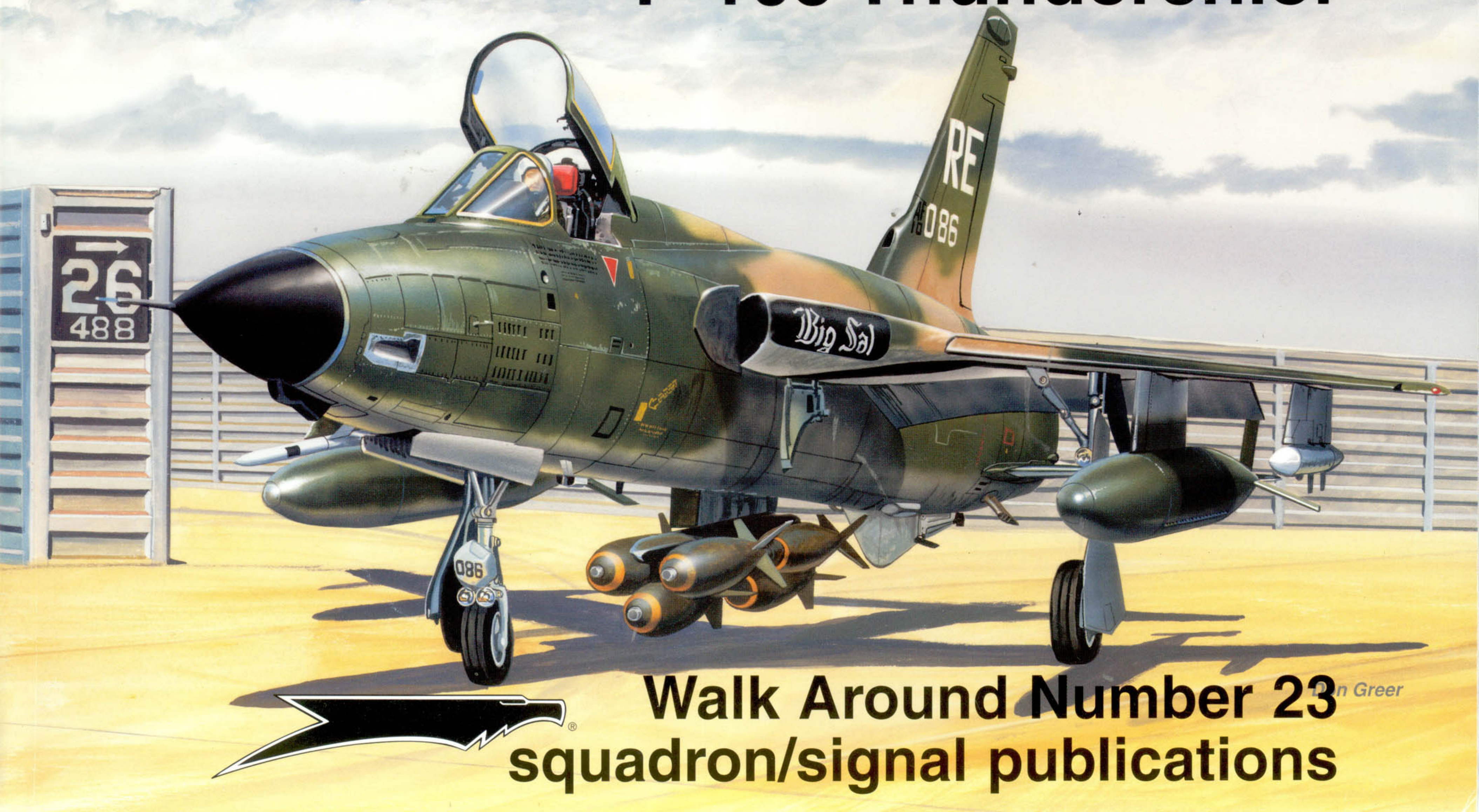
5523

Walk Around

F-105 Thunderchief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AE
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Don Greer

Walk Around Number 23

squadron/signal publications

Walk Around

F-105 Thunderchief

By Ken Neubeck
Color by Don Greer and Andrew Probert
Illustrated by Ernesto Cumpian

Walk Around Number 23

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Introduction

The **Republic F-105 Thunderchief** was developed to meet a United States Air Force (USAF) need for a fighter bomber capable of both replacing the Republic F-84 Thunderjet and carrying nuclear weapons. Republic Aircraft Company's proposal AP-63 was developed in 1953 and was later designated F-105 by the USAF. The Thunderchief, eventually to be referred to as the 'Thud,' was the largest single engine jet fighter ever developed for the Air Force.

Two **YF-105A** aircraft were built and both flew in 1955; however, both technical problems and much Air Force indecision plagued the production aspect of the program. Engine thrust technical problems were resolved by upgrading to the Pratt & Whitney J75 turbojet and making the aircraft capable of almost Mach 1.5. The fighter was fitted with a 20mm cannon and was capable of carrying conventional bombs. The first production F-105, now designated the **F-105B**, finally rolled off the Republic assembly line in Farmingdale, New York in 1958. A total of 75 F-105Bs were built along with three **JF-105B**s that were originally intended for the reconnaissance role, but later used for testing. A two-seat **F-105C** trainer was proposed in 1956; however, this aircraft was later cancelled.

The single seat **F-105D** was a radical upgrade from the F-105B — it was the first aircraft to employ the concept of fully integrated avionics. Significant changes to the avionics and cockpit instrumentation allowed the F-105 to be an all-weather fighter. This version was heavier as well as having a longer fuselage in order to accommodate the additional radar equipment. Production began in 1959 and the F-105D became the most numerous variant with 610 aircraft built. The concept of another two-seat trainer version, the **F-105E**, was considered in 1959, but like the C version, it too was cancelled prior to any development — only a mockup was built.

The F-105D became the USAF's primary fighter-bomber during the Vietnam Conflict, conducting its first missions in 1965 and continuing throughout the war. The F-105 was well suited for the role due to its maneuverability and stability during high-speed, low altitude flight. The F-105D was later augmented by the two-seat **F-105F**, which was used in the 'Wild Weasel' surface-to-air missile (SAM) suppression role over North Vietnam. A total of 143 F-105Fs were built. Fifty-five F-105F aircraft were later converted to the **F-105G**, which had an improved electronic countermeasures (ECM) capability. 'Thud' pilots flew over 20,000 missions in Vietnam and accounted for over 75 percent of all of the bombing missions flown during the war. These missions were made dangerous by the presence of both SAMs and MiG fighters. Of the 750 F-105s used during the war, 397 were lost in combat or in accidents, literally depleting the F-105 fleet of its operational capability by 1974. F-105s accounted for 27.5 MiG kills and the destruction of many North Vietnamese SAM sites during the war.

The last F-105s served in the USAF until 1980, when the F-105Gs were replaced by McDonnell Douglas F-4G Phantoms. The last operational F-105Gs served in the 128th Tactical Fighter Squadron (TFS) of the Georgia Air National Guard (ANG) until 1983. The Republic Aircraft Company, which merged with Fairchild Hiller to become the Fairchild Republic Company in 1961, continued to produce aircraft for the USAF in the form of the A-10 Thunderbolt II — also known as the Warthog. Fairchild Republic ceased operations in 1987 when its T-46A trainer failed to win the competition for the USAF's new jet trainer program. Although the company doors are closed and the roar of the 'Thud's J75 engine is silent, the war cry of the Thunderchief lives on the memory of it builders, maintainers, and pilots.

Acknowledgements

The author wishes to express his sincere thanks to Joshua Stoff, the curator of the Cradle of Aviation Museum in Long Island, and his staff for the use of their photo archives as well as making their F-105B exhibit available for in-detail photography. The museum has preserved photo archival material from the Fairchild Republic Company since the time of their closing in 1987. The author also wishes to thank Dennis R. Jenkins, Dave Conroe, John Golden, Ken Kubik, Mick Roth, Curtiss Knowles, and Glen Phillips for their contribution of materials and photographs. Al Hunlstrunk and the Empire State Aerosciences Museum in Scotia, New York are also gratefully acknowledged for allowing their F-105G exhibit to be photographed. A special thanks also goes to Michael's Prolab for developing the archival photographs.

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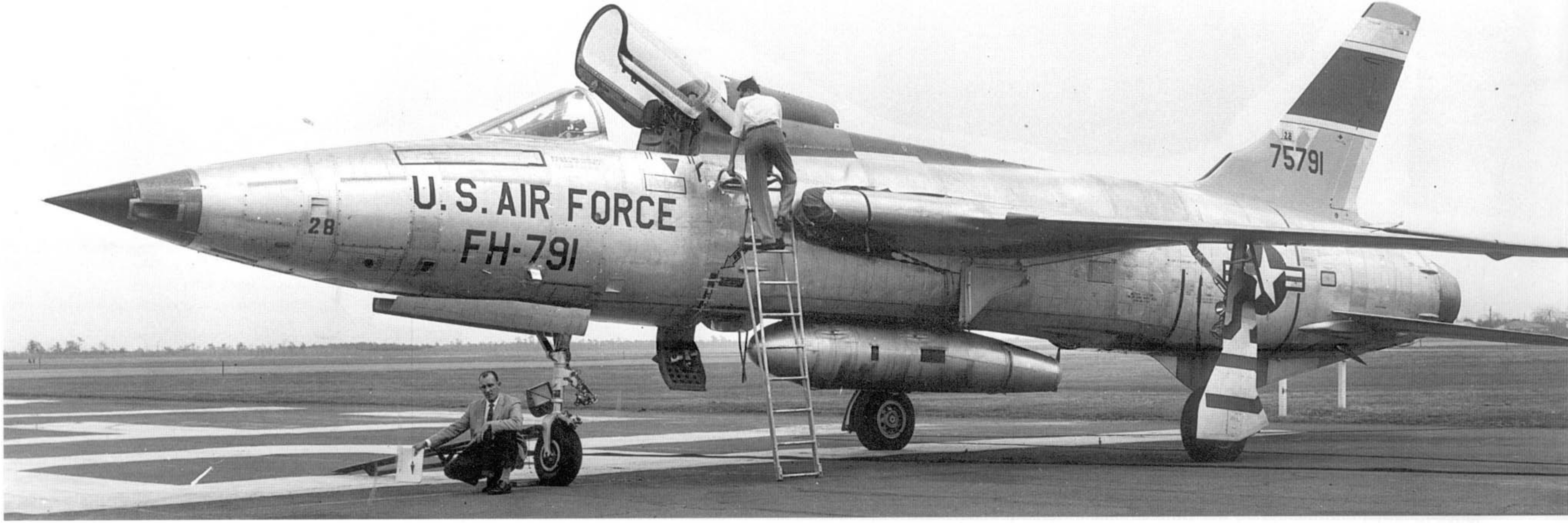
(Front Cover) ***Big Sal*, an F-105D Thunderchief (61-086) is serviced by its ground crew at Takhli Royal Thai Air Base (RTAB), Thailand during the Vietnam conflict. This aircraft was assigned to the 44th Tactical Fighter Squadron (TFS), 355th Tactical Fighter Wing (TFW). The F-105D is armed with six 750 pound (337.5 kg) bombs mounted on the centerline pylon.**

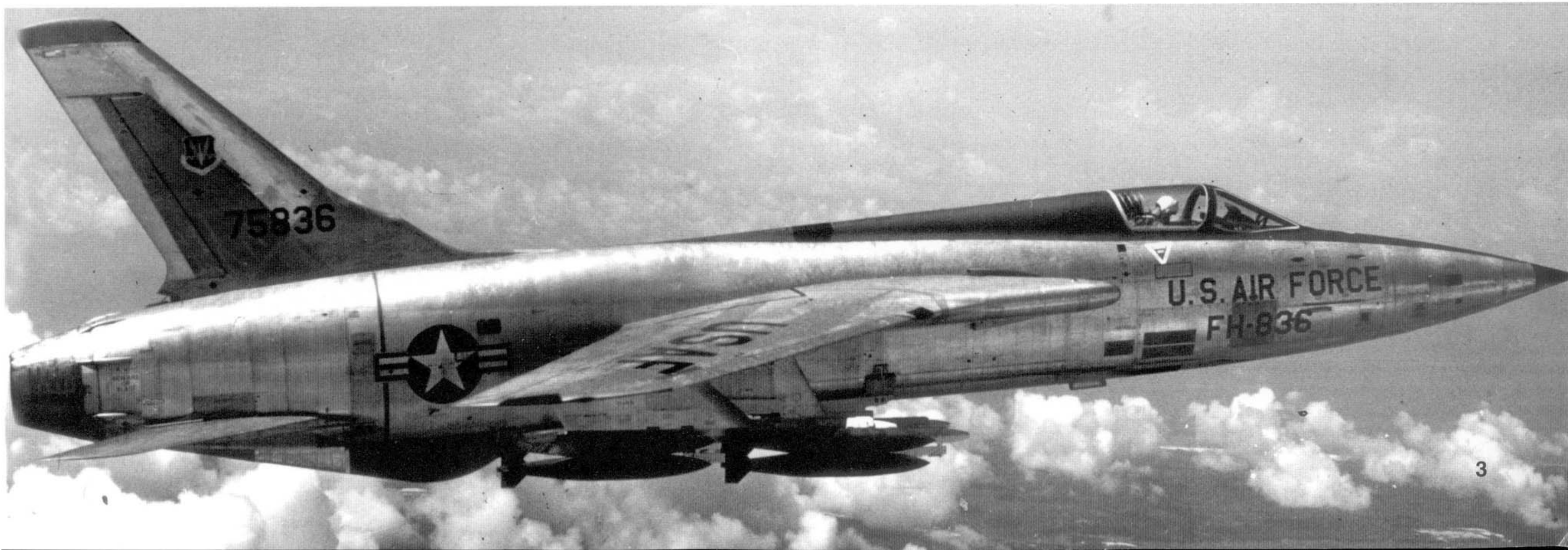
(Previous Page) A two-seat Republic F-105F Thunderchief (63-8321) assigned to the 357th TFS, 355th TFW prepares for takeoff from Korat RTAB, Thailand in December of 1968. A 650 gallon (2457 L) fuel tank is mounted on the aircraft's centerline, while a Texas Instruments AGM-45 Shrike Anti-Radiation Missile (ARM) is placed on the port outboard wings pylon. F-105Fs took over the Wild Weasel defense suppression role from North American F-100F Super Sabres in July of 1966. (Cradle of Aviation Museum)

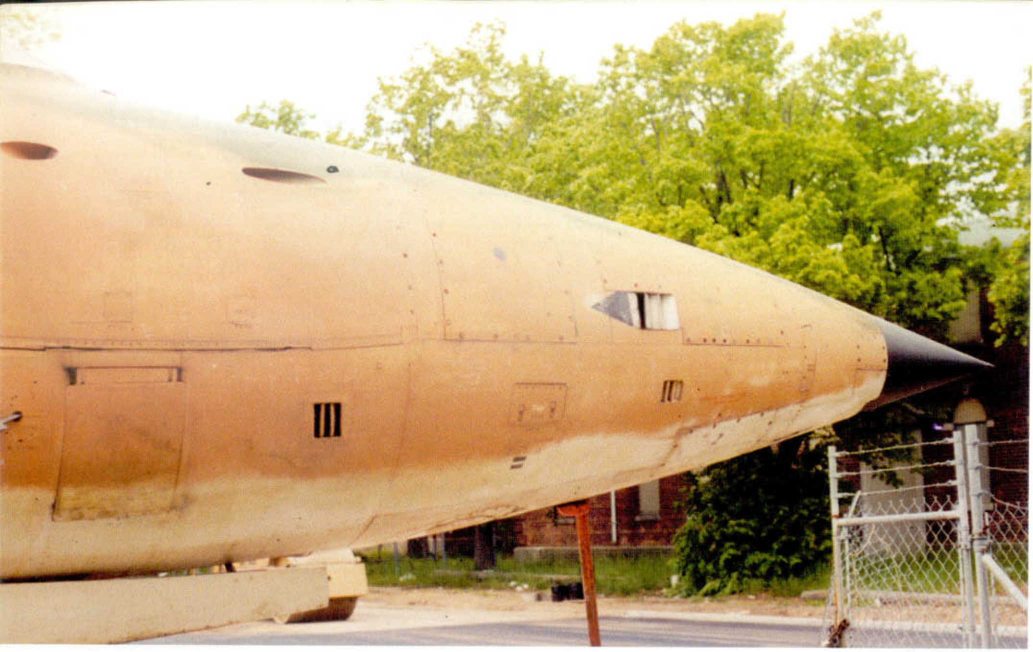
(Back Cover) NORTH BOUND, an F-105G Wild Weasel (63-8285), pulls off from a strike over 'Thud Ridge' in Vietnam while providing SAM (Surface to Air Missile) suppression for the attack. The Thunderchief was assigned to Detachment 1, 561st TFS, 388th TFW at Korat RTAB.



(Above) Republic engineers evaluate an early F-105B (57-5791) at the Republic's facility in Farmingdale, Long Island, New York. Early F-105s were left in a natural metal finish with Olive Drab (FS34087) anti-glare panels painted fore-and-aft of the cockpit. The tail band is Green trimmed in White. The rectangle on the forward fuselage left and forward of the cockpit housed the inflight refueling probe. This rectangle was red on non-camouflaged F-105s. (Cradle of Aviation Museum)

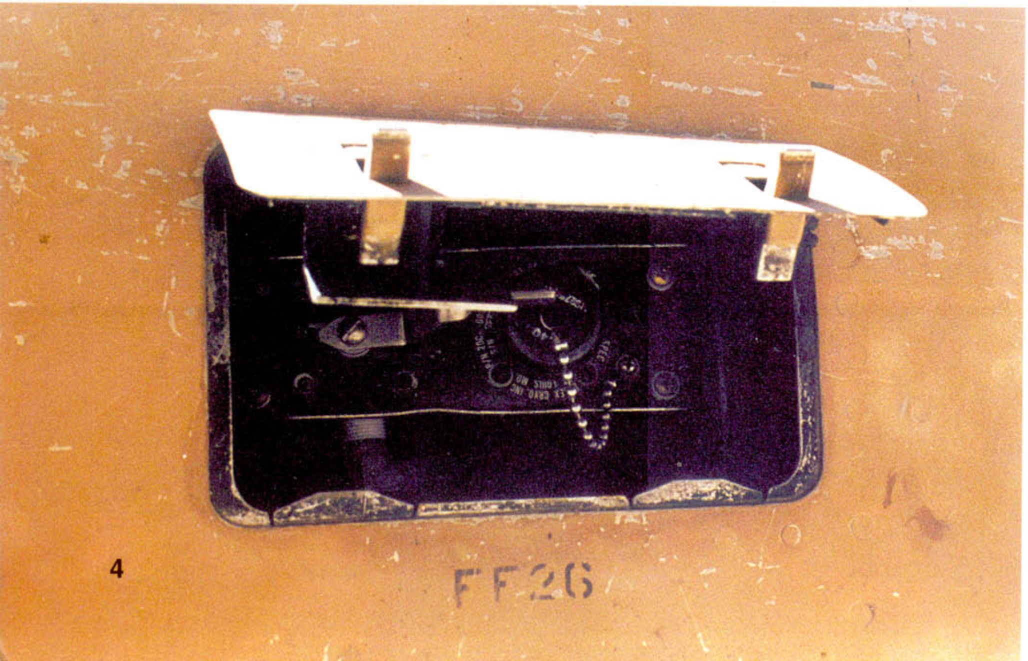
(Below) A production F-105B (57-5836) cruises high above the clouds carrying six 500 pound (226.8 KG) bombs on the centerline pylon. The F-105 was originally designed to be a high altitude, supersonic fighter capable of delivering a nuclear weapon. Republic built and delivered 77 production F-105Bs to the Air Force. The Tactical Air Command (TAC) insignia is placed on the tail (Cradle of Aviation Museum)

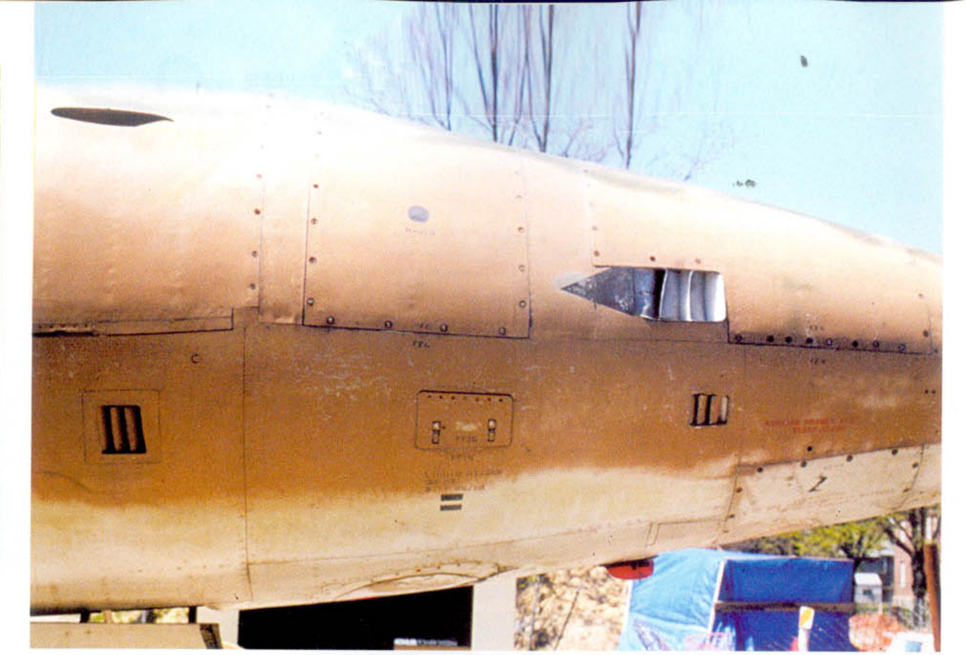




The F-105B's radome housed the E-34 fire control radar. This ranging radar provided distance-to-target information for the Thunderchief's General Electric MA-8 fire control system. The MA-8 was only a 'clear weather' system, which could not find targets at night or in bad weather. Cooling vents aft of the radome allowed the considerable heat generated by the MA-8 system to escape from the nose compartment.

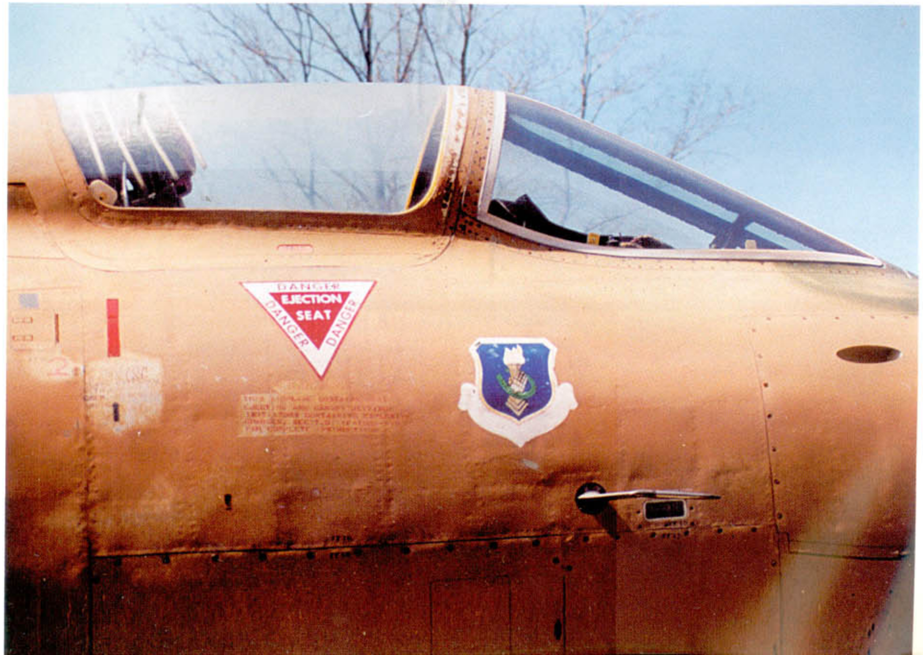
The F-105B's liquid oxygen refilling valve cover is connected to the valve with a chain. The valve leads to a converter, which changes the oxygen from a liquid to a gaseous state for the pilot's breathing use. The liquid oxygen converter stored 2.6 gallons (10 L) of oxygen. The valve access door is hinged at the top and is secured with two flush latches.

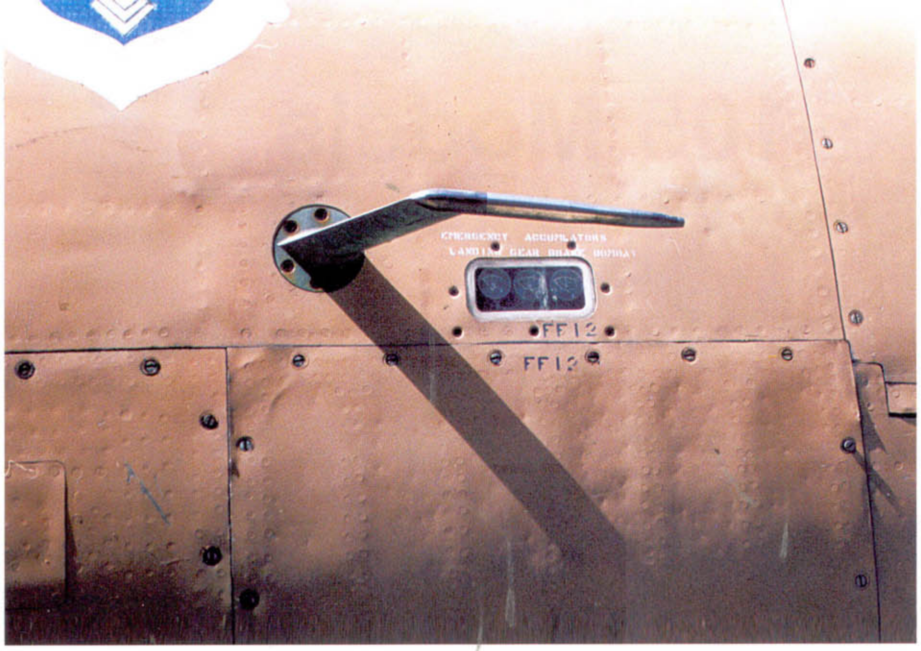




A variety of vents and access panels are located on the starboard side of the F-105B's nose. The liquid oxygen (LOX) system access door is located between two of the cooling vents. LOX system access was relocated to the left side of the forward fuselage in later F-105 models.

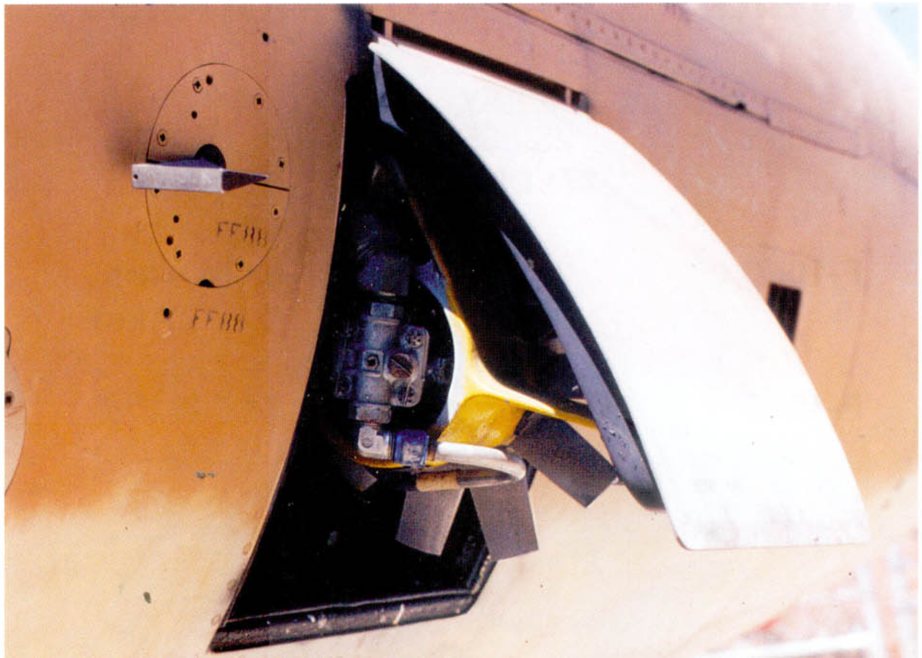
Single seat F-105s were equipped with a single windscreen and clamshell canopy hinged at the rear. The center windscreen consisted of laminated, bullet resistant glass incorporating an electric defogging system between the laminations. The quarterlights consisted of two plexiglas panels with an air space between them for demisting purposes. The starboard pitot tube is mounted on the fuselage below the windshield.

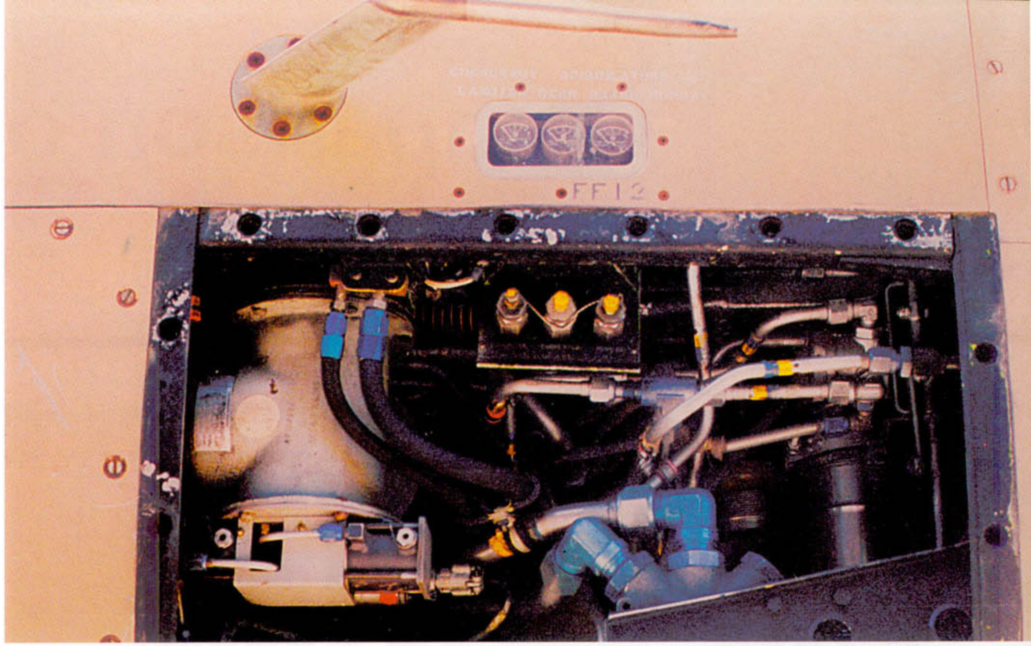




The pitot-static tube is located on both sides of the forward fuselage and is used to provide air speed data to the F-105B's cockpit instruments. Three small hydraulic gauges are set into the fuselage below the starboard pitot tube. Ground crews used these gauges when servicing the aircraft hydraulics through the access panel below the gauges.

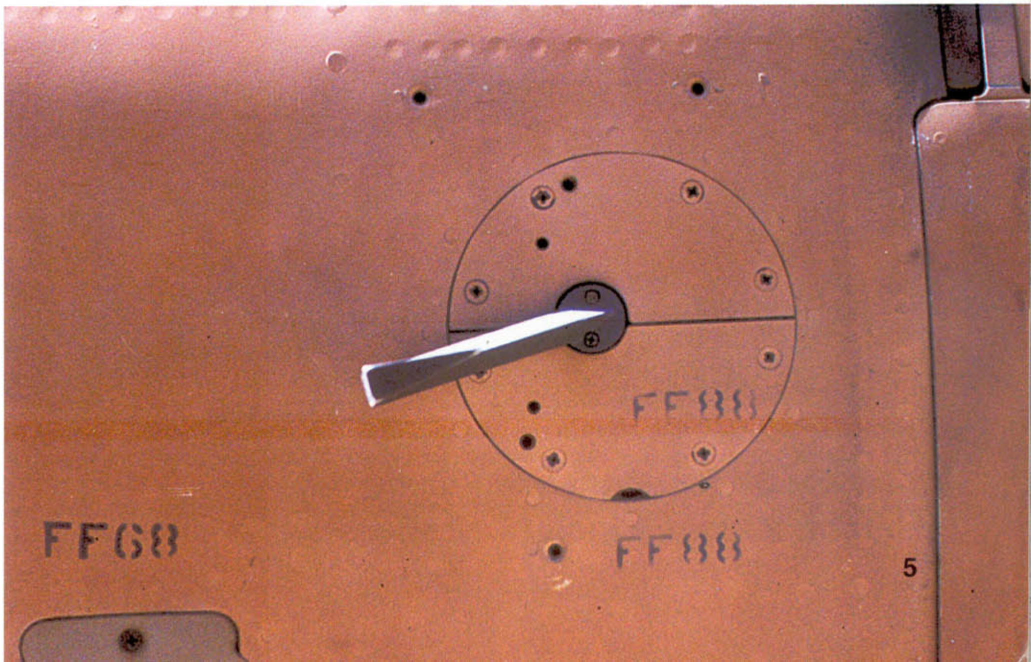
The emergency ram air turbine (RAT) is mounted within the fuselage on the starboard side of the aircraft. In the event of an in-flight engine failure, the door opens and the ram air turbine is deployed to generate emergency power for the hydraulically powered flight controls. The RAT draws fluid from the F-105B's utility hydraulic system reservoir located in the nose.





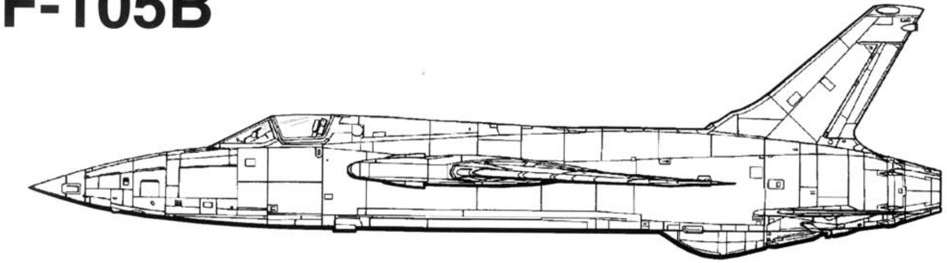
A hydraulic system access panel is located below the three hydraulic gauges. These pressure indicator gauges are (L to R): landing gear uplock, emergency brakes, and the bomb bay doors. The gauges are accessed by the three switches directly below the gauges. A hydraulic accumulator is placed in the aft portion of this compartment.

The angle-of-attack (AOA) sensor is mounted on the starboard side of the fuselage immediately behind the emergency ram air turbine (RAT). The entire AOA arm pivots to stay perpendicular to the airflow and feeds data to both the flight instruments and the weapons release system.

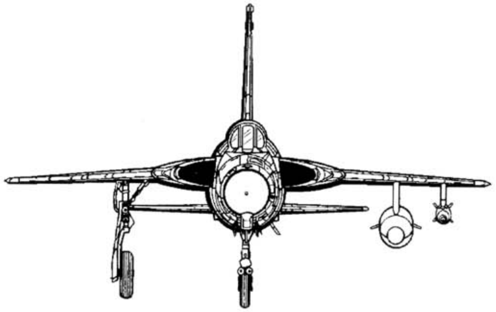


Comparison of F-105 Models

F-105B

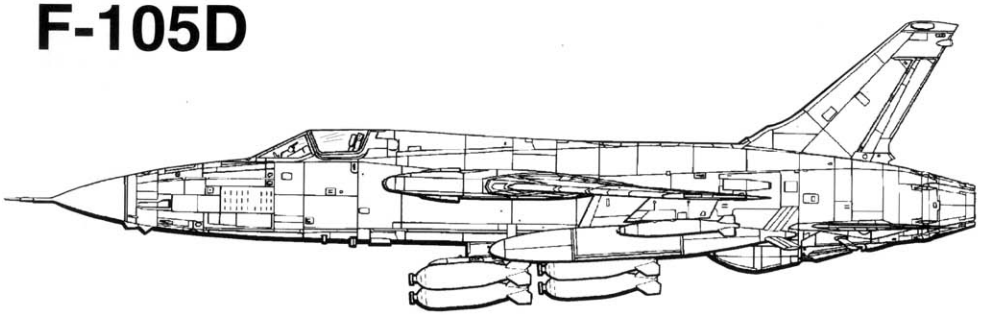


Length: 63 feet 1 inch (19.22 M)
Height: 19 feet 8 inches (5.99 M)



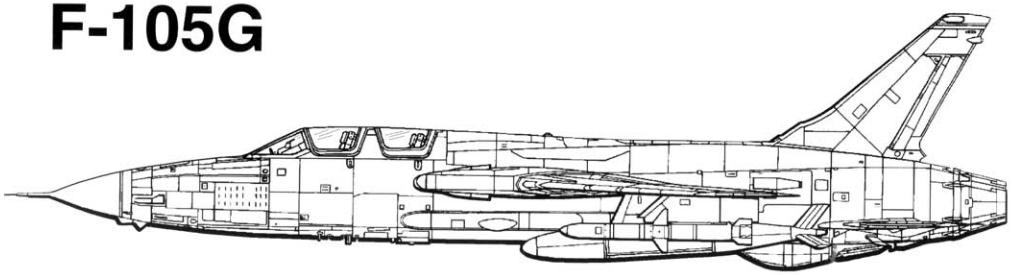
Wingspan for all F-105s: 34 feet 11 inches (10.64 M)

F-105D



Length: 64 feet 5 inches (19.63 M)
Height: 19 feet 8 inches (5.99 M)

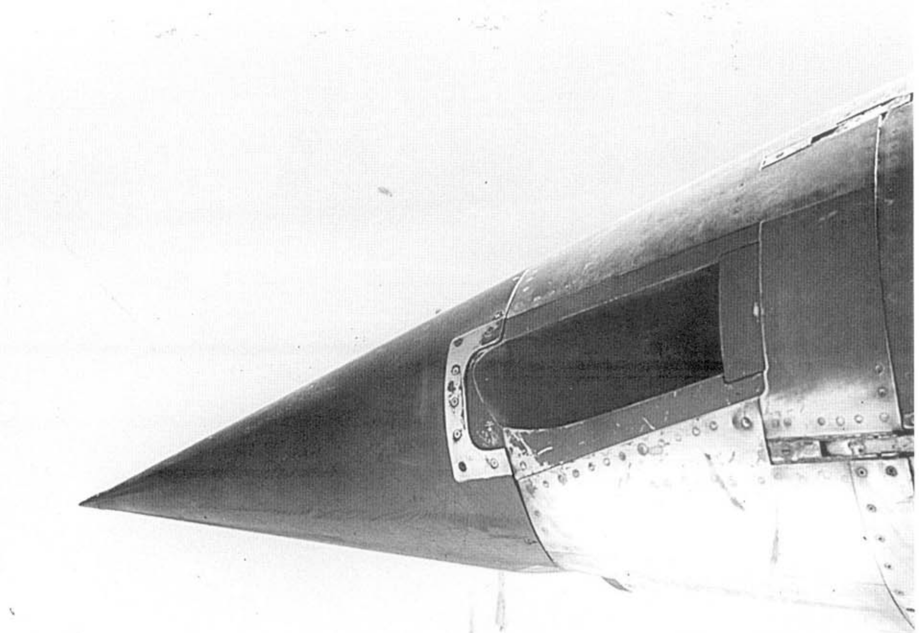
F-105G



Length: 67 feet 0 inches (20.4 M)
Height: 20 feet 1 inch (6.12 M)

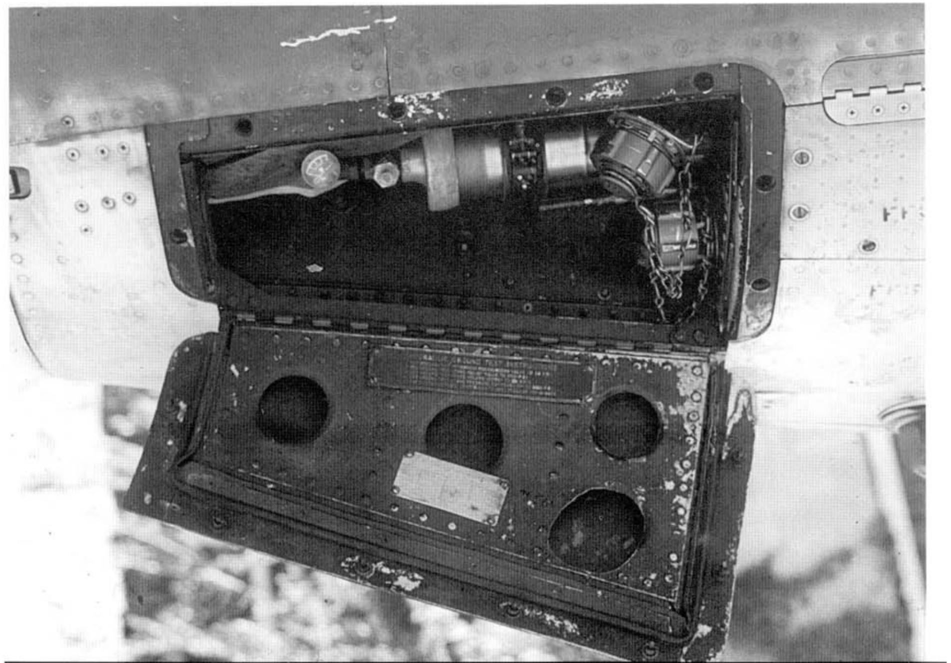
Weights of F-105 Models

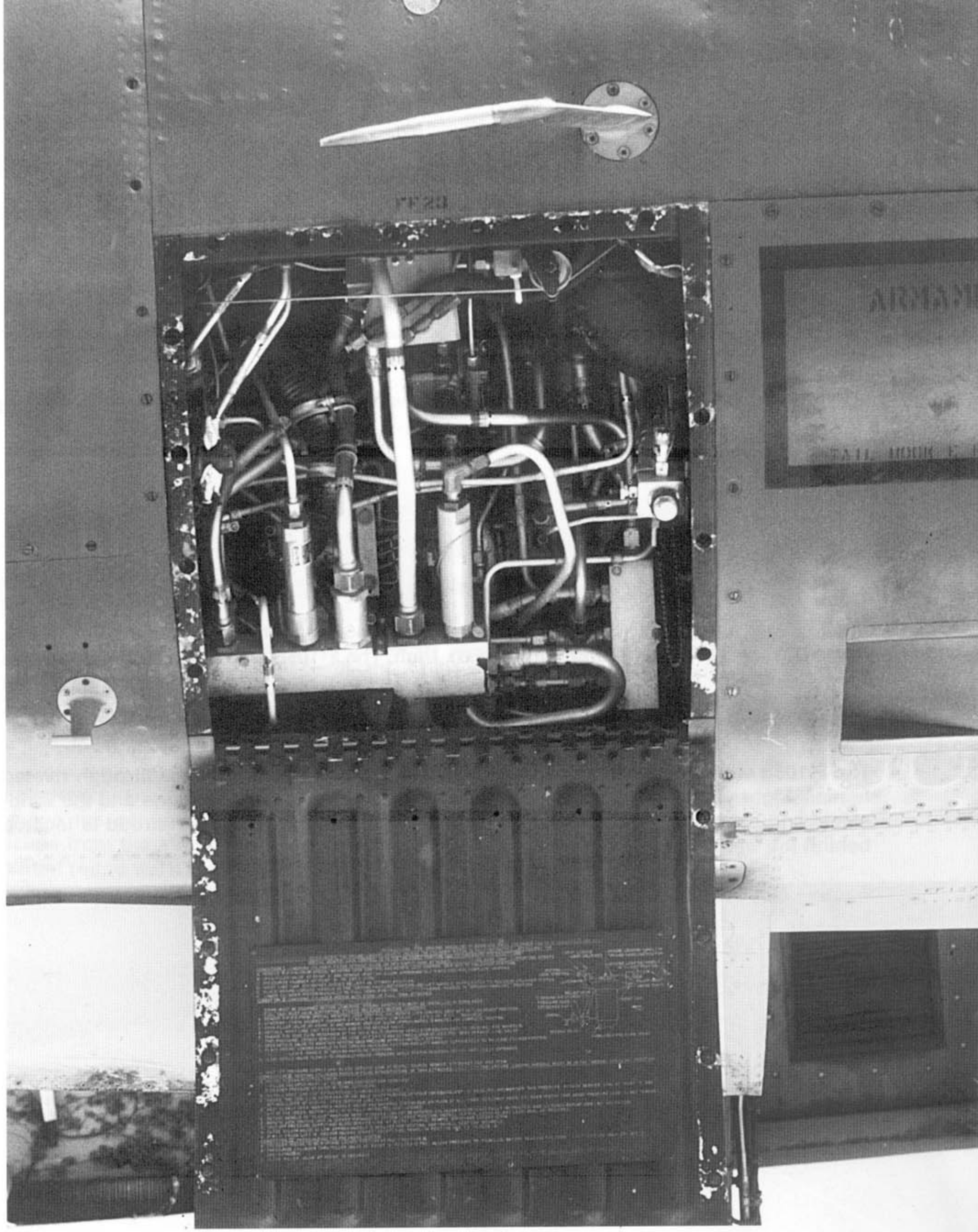
	Empty	Maximum
F-105B	25,855 lbs (11,635 KG)	52,000 lbs (23,400 KG)
F-105D	26,855 lbs (12,085 KG)	52,838 lbs (23,777 KG)
F-105G	31,279 lbs (14,076 KG)	54,580 lbs (24,561 KG)



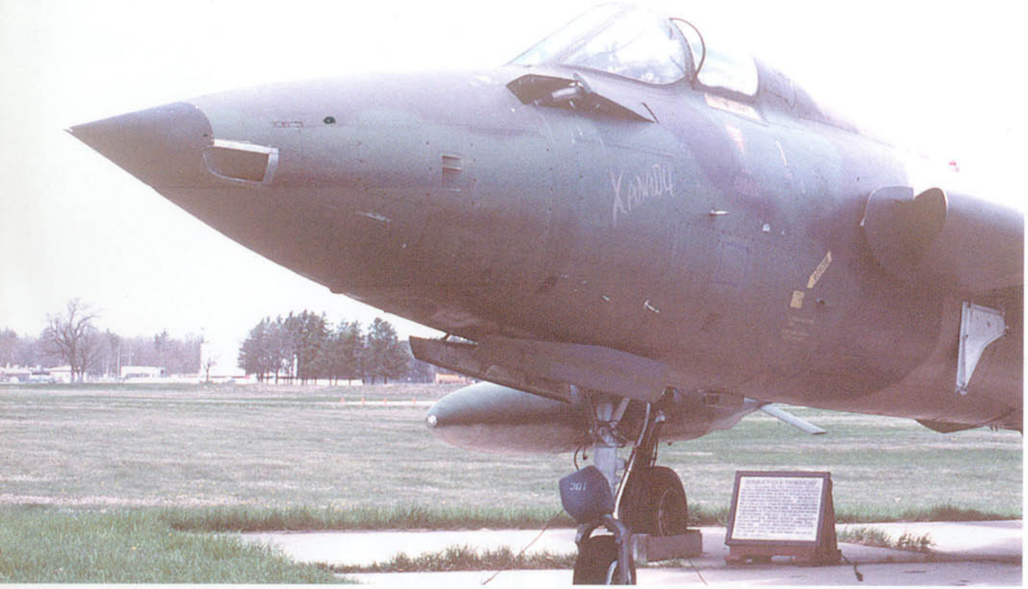
The 20MM M-61A1 Vulcan cannon's muzzle opening was placed immediately behind the radome on the F-105B's port side. The six-barreled General Electric M-61A1 could fire up to 6000 rounds per minute and equipped all F-105 production variants. The F-105B was supplied with 1075 rounds of 20MM ammunition for the cannon; later versions carried 1028 rounds. The radome was hinged to port for servicing the E-34 ranging radar.

An access door behind the F-105B's radome covers the hydraulic ground test unit. Maintenance personnel used this valve to test the aircraft's available hydraulic pressure and quantity. A red anti-collision light is mounted behind and to starboard of the access panel.



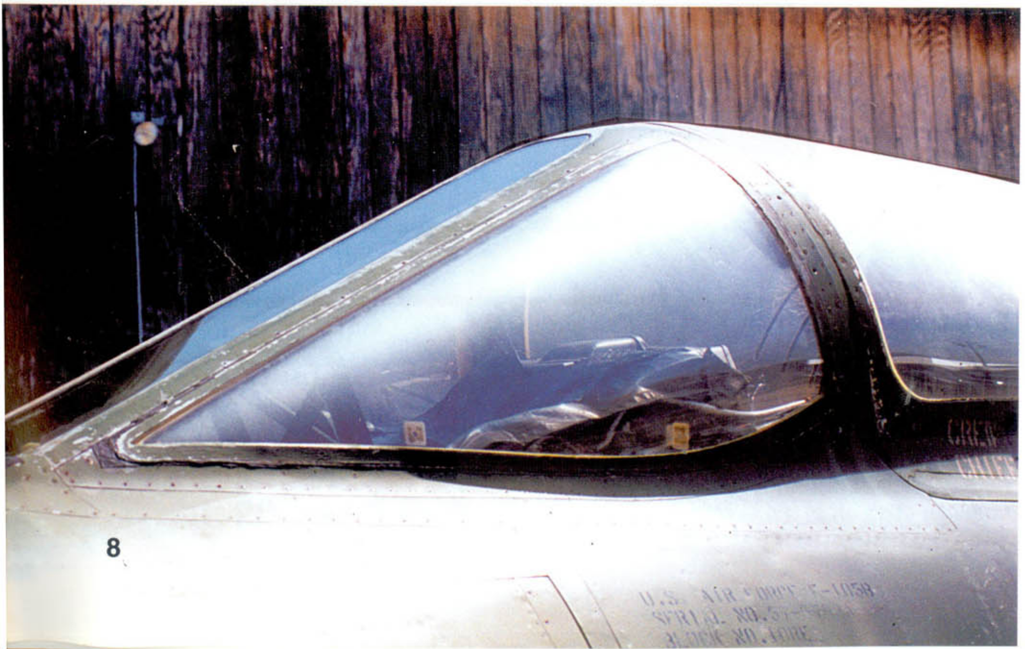


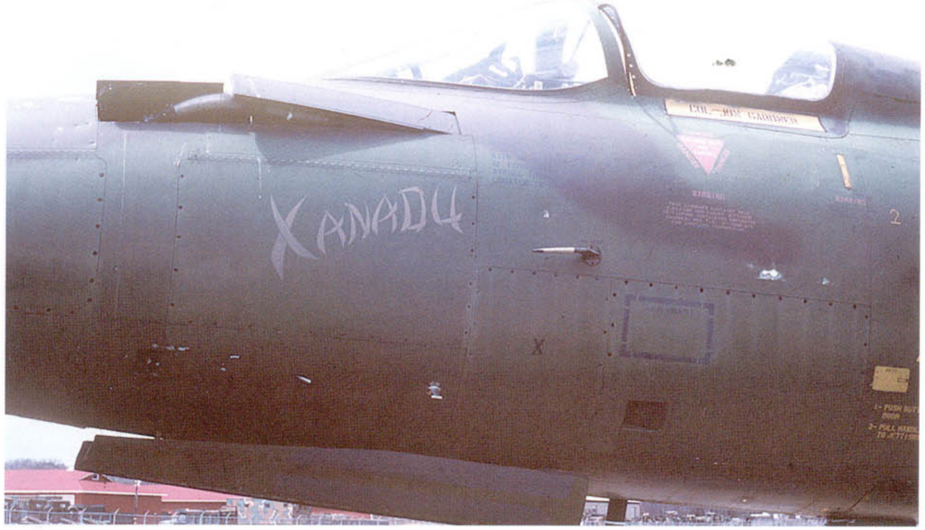
A hydraulic system access panel is located beneath the port pitot tube. Access doors of this type are opened by turning each of the captive slotted head screws one half of a turn around the outside perimeter of the door. The pitot tube above the doorway collects data for the airspeed indicator. Ground crews chalked external weapons loads inside the black armament box aft of the access panel.



Xanadu was an F-105B (57-5838) assigned to the 466th Tactical Fighter Squadron (Air Force Reserve) at Hill Air Force Base (AFB), Utah. The F-105B was flown by the Squadron from January of 1973 until November of 1982. The refueling probe door on the forward fuselage is partially open on this aircraft. The F-105B was on display at Volk Field, Wisconsin during May of 1984. (Curtiss Knowles)

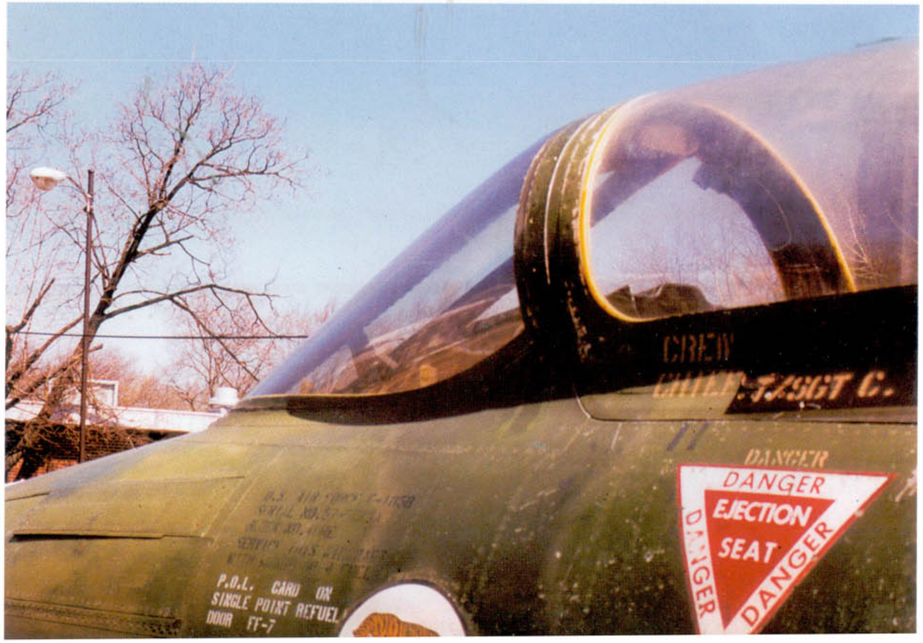
The F-105B windshield panels and canopy were secured to the fuselage through riveted frames. Light yellow rubber tubing provides a seal between the clear parts and the windshield and canopy frames. The upper portion of the instrument panel shroud is located behind the windshield.

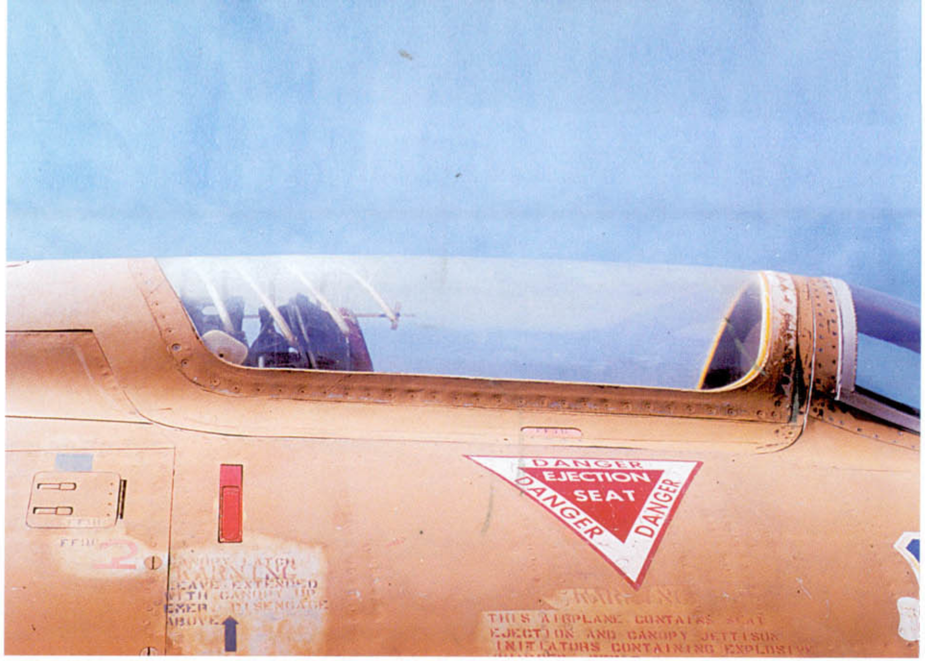




The F-105B was equipped with an in-flight refueling probe mounted forward and port of the windshield. The refueling probe door is partially open on *Xanadu* (57-5838), an ex-466th TFS Thunderchief displayed at Volk Field. (Curtiss Knowles)

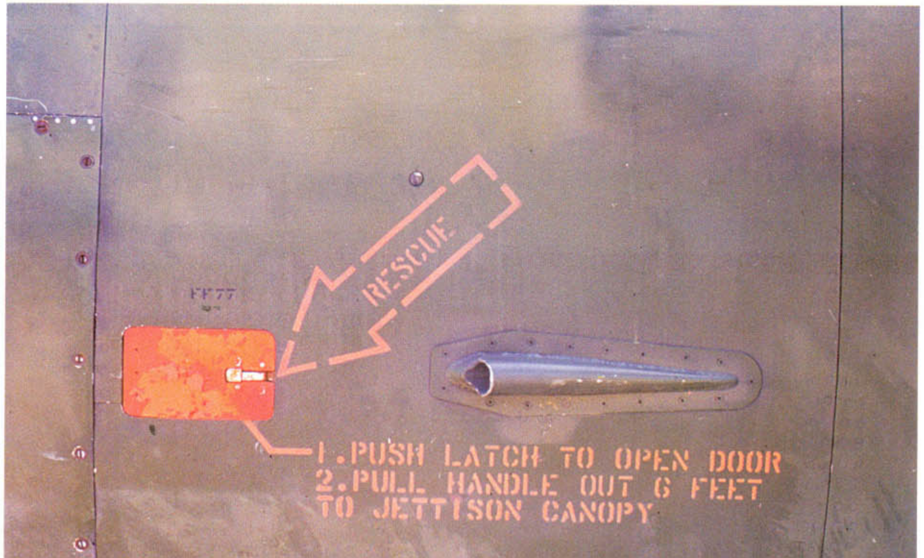
Rear view mirrors were mounted on the F-105B's windshield frame to assist the pilot in seeing objects behind him. The partially opened rectangular door below the forward windshield edge enclosed a retractable in-flight refueling probe. F-105 pilots used the probe to take on fuel from drogues trailed by tanker aircraft. Thunderchiefs later received a boom-type refueling receptacle in front of the windshield.

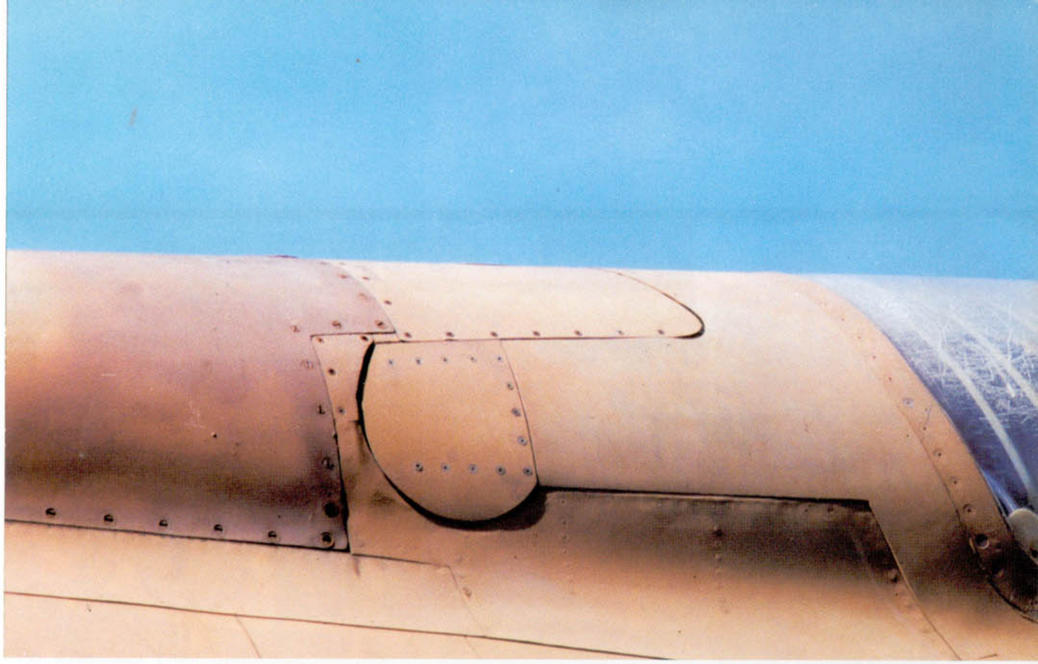



DANGER
EJECTION
SEAT
DANGER
DANGER
WARNING
THIS AIRPLANE CONTAINS SEAT
EJECTION AND CANOPY JETTISON
INITIATORS CONTAINING EXPLOSIVE

The red canopy lock lever under the starboard canopy edge of the F-105 is duplicated on the port side of the aircraft. This lever is pushed in to unlock the canopy for opening in the event of an emergency on the ground. Embedded into the aft canopy section is the AN/ARN-59 ADF (Automatic Direction Finder) antenna, which received radio signals from ground stations to confirm the aircraft's position and bearing.

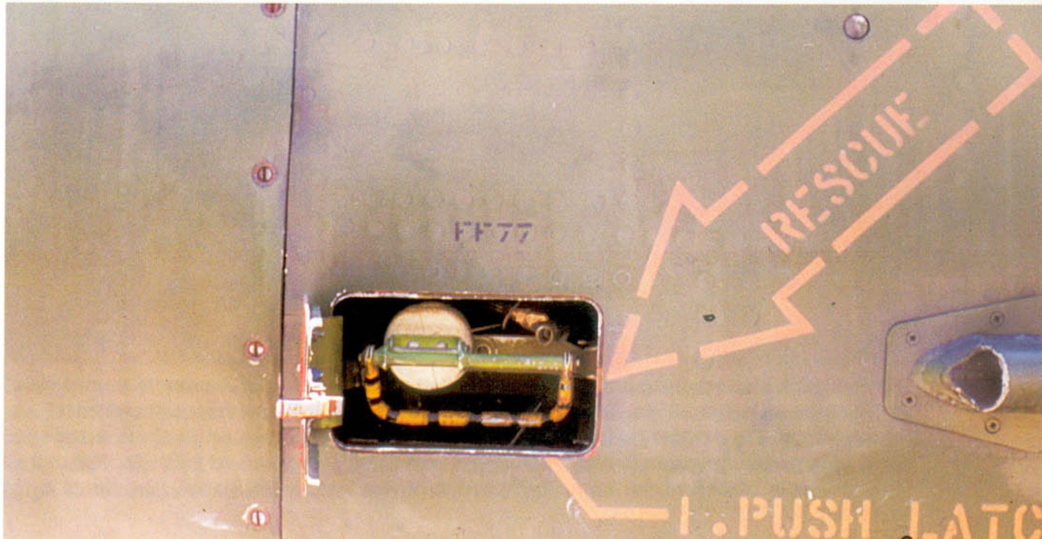
The canopy emergency release door is located on the port forward fuselage under the canopy. In the event of an emergency, a ground crew member grabs the handle, trails the line out six feet (1.8 M), and then pulls hard in order to jettison the canopy. A cooling air intake is placed just aft of the canopy release door.

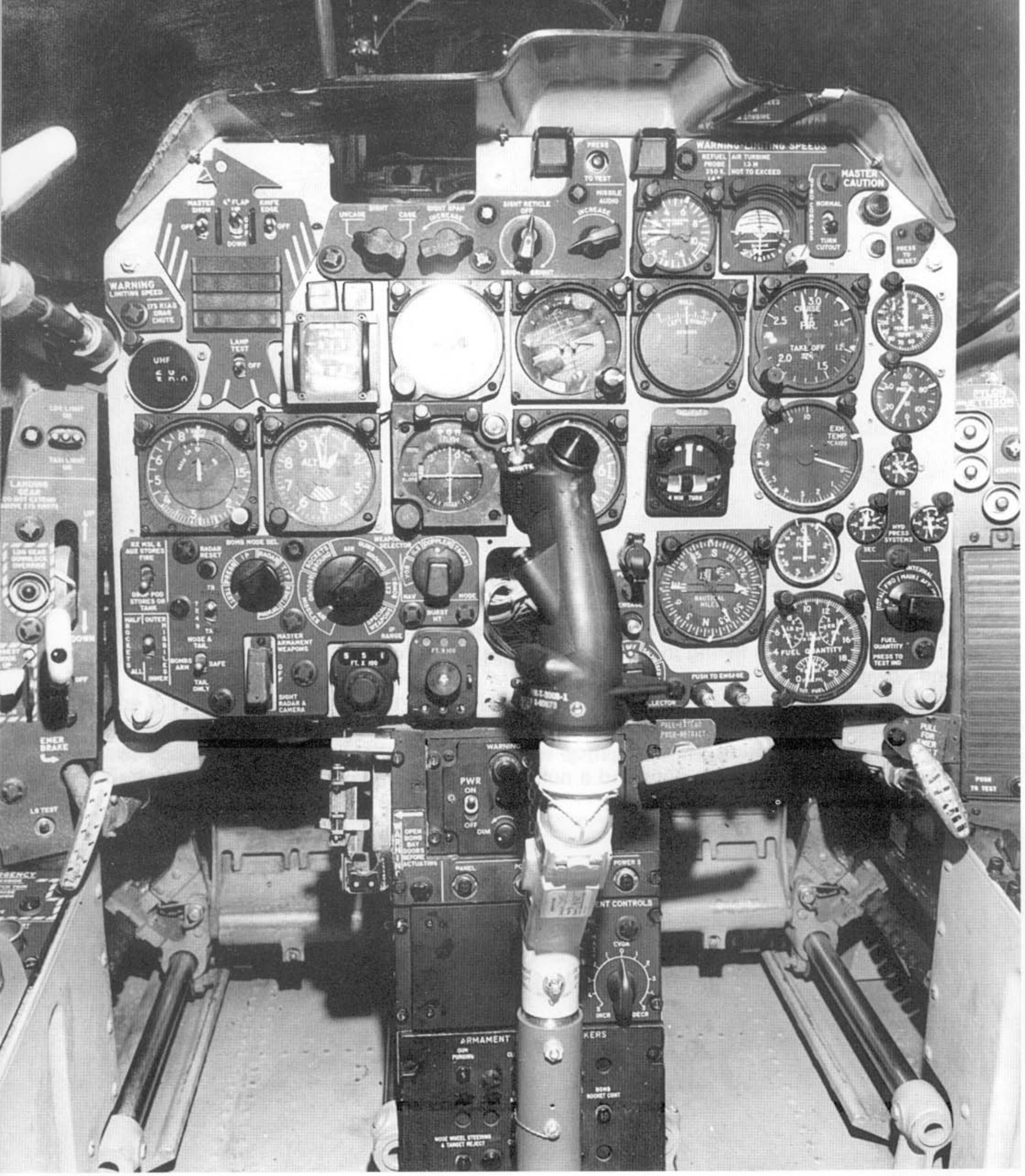

RESCUE
FF77
1.PUSH LATCH TO OPEN DOOR
2.PULL HANDLE OUT 6 FEET
TO JETTISON CANOPY



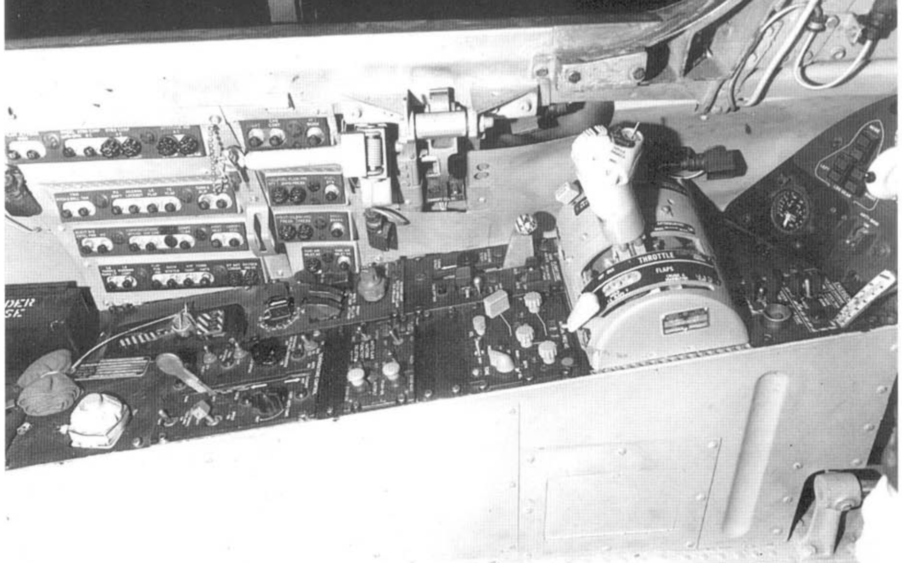
The curved panel behind the F-105's canopy provided access to the canopy hinge. All Thunderchief variants used hydraulically-powered, rear-hinged clamshell canopies. The canopy pivoted on the round-ended canopy arms leading from the aft canopy edge. The fuselage spine surfaces facing the canopy arms were beveled to allow the arms to move up and down.

The opened canopy emergency release door reveals the yellow and black handle used to remove the canopy during an emergency when the pilot cannot open his canopy to escape from the aircraft. This door and a number of other emergency access doors are painted red to warn the ground crew.


RESCUE
FF77
1.PUSH LATC

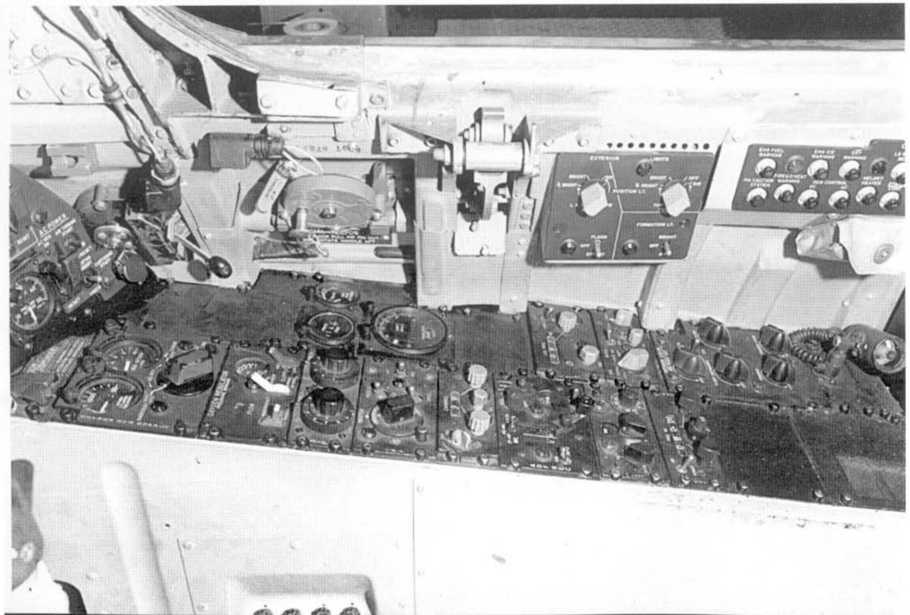


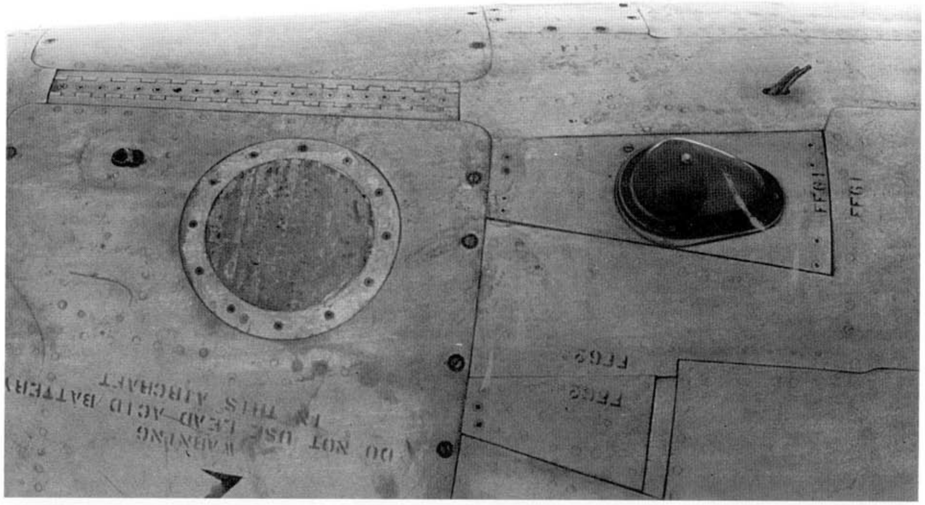
The F-105B's instrument panel primarily used standard analog instruments common in aircraft designed in the 1950s. The floor-mounted control stick was also a standard 1950s Air Force design. The rudder pedals were attached to metal bars placed just above the cockpit floor. This particular cockpit was installed on one of the Thunderbird F-105Bs. Special show flight controls placed in the upper left portion of the instrument panel. (Cradle of Aviation Museum)



The throttle quadrant is mounted on the port side of the F-105B's cockpit and includes the flap control lever inboard of the throttle. Radio and autopilot controls are located immediately aft of the throttle quadrant, with cockpit temperature controls further aft on the console. Circuit breakers are placed along the cockpit wall. The basic cockpit color on all F-105s is Interior Gray (FS36231). (Cradle of Aviation Museum)

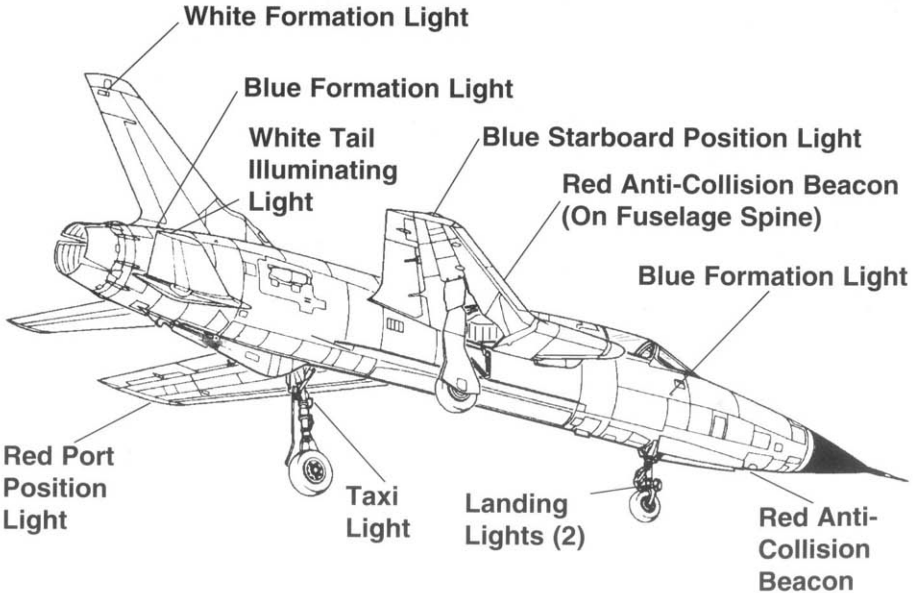
The F-105B's starboard cockpit console includes the oxygen regulator at the front of the panel. Navigation and radio controls are located aft of the oxygen regulator. Interior lighting controls and a utility light are mounted at the aft end of the console. The pilot used the utility light to read maps and to find items in the cockpit at night. External light controls and circuit breakers are placed in the right cockpit wall. (Cradle of Aviation Museum)

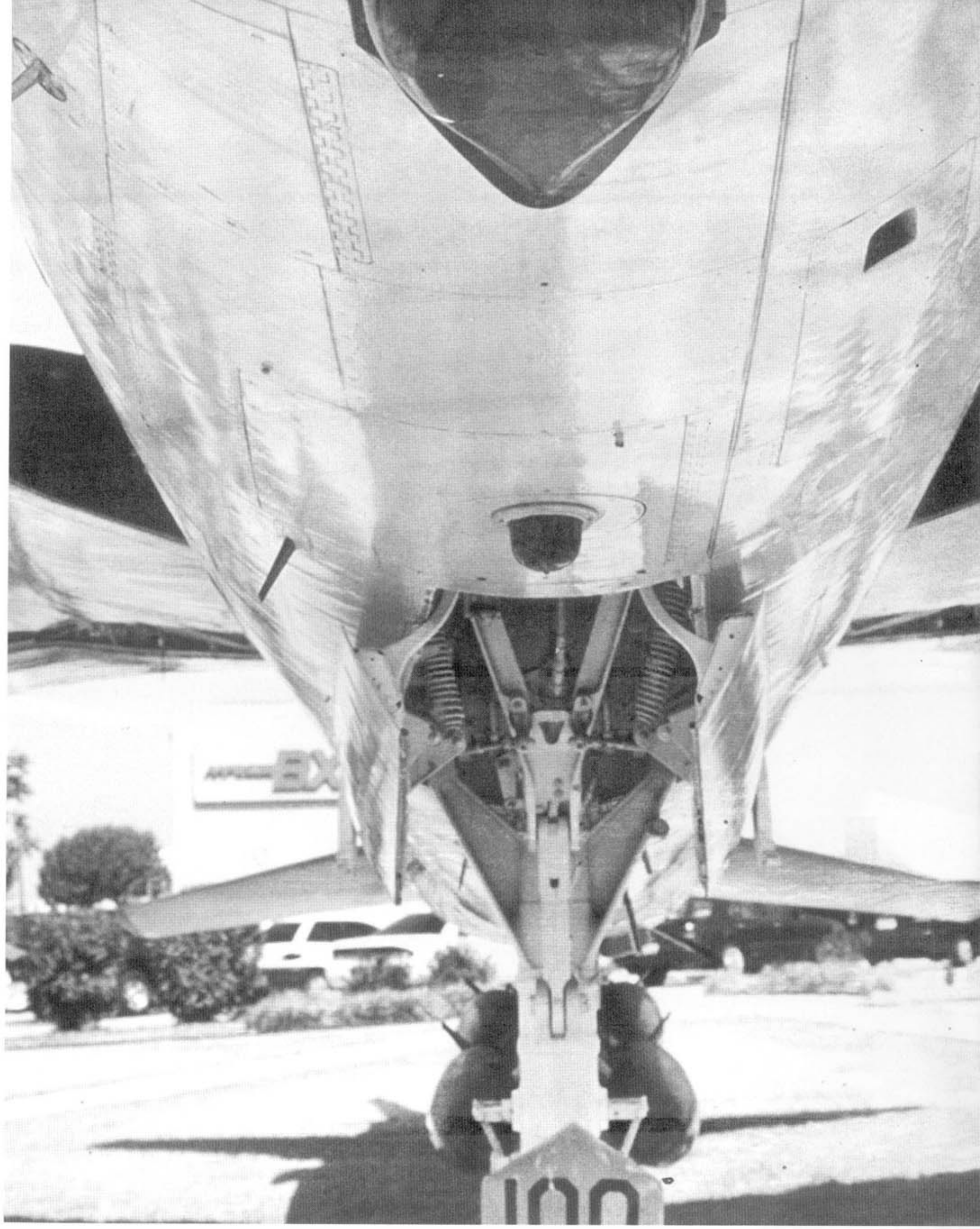




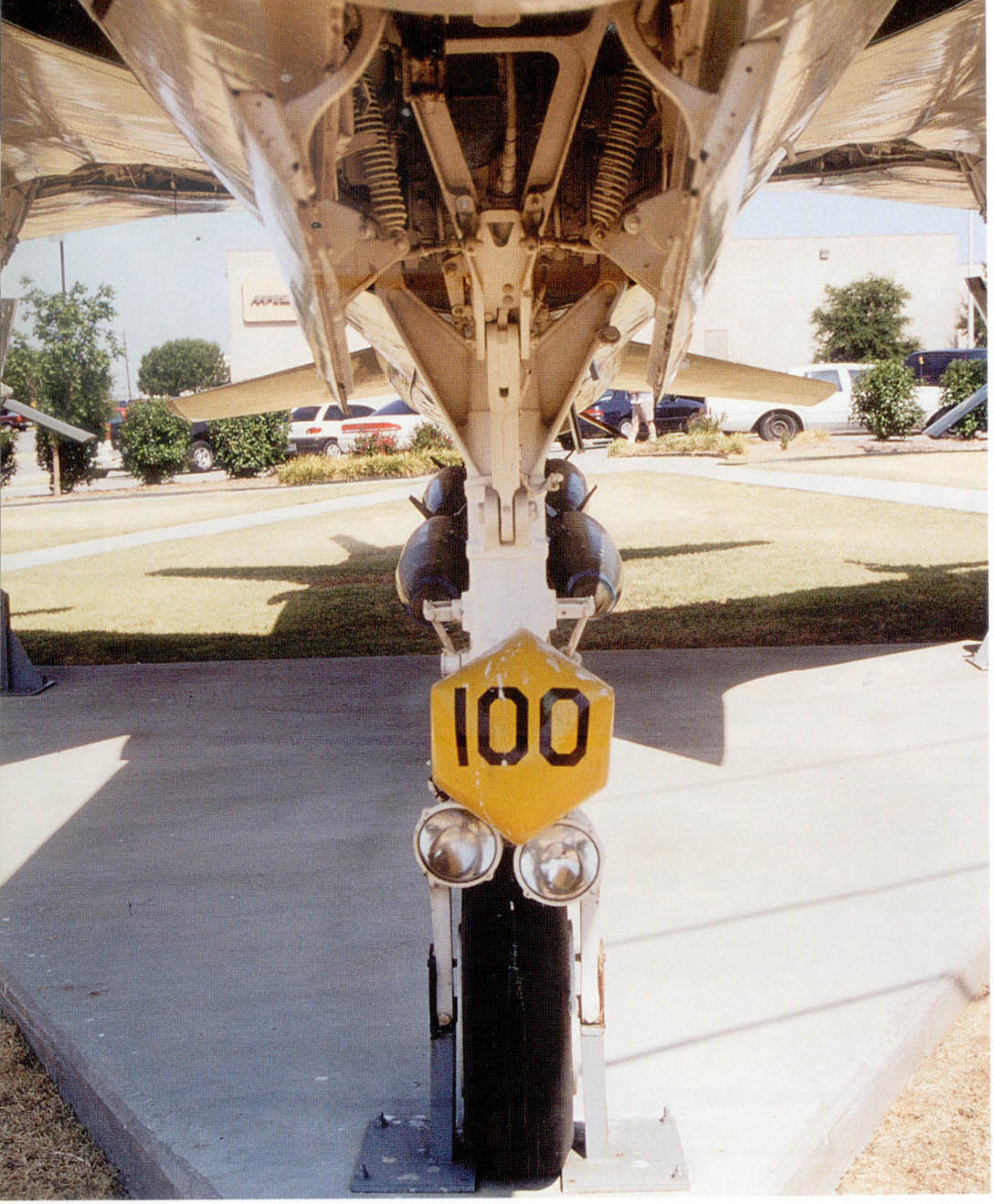
The fuselage underside, in front of the F-105B's nose gear bay, houses the circular AN/ARN-62 TACAN (TACtical Air Navigation) antenna and a red anti-collision beacon. As opposed to antenna extrusions on later model F-105s, the antennas of the F-105B were made of fiberglass and were made flush with the surrounding metal skin.

F-105 Exterior Lights

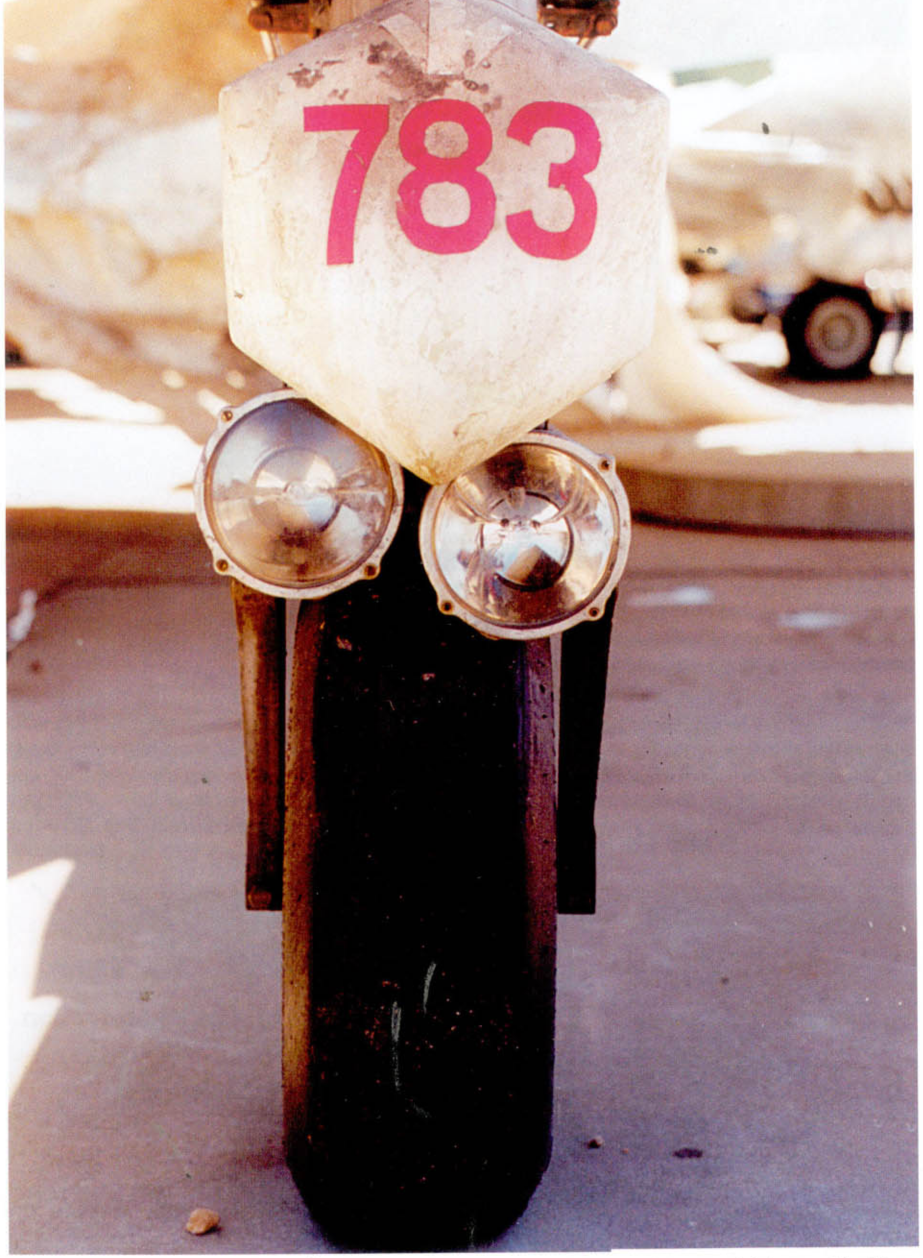

White Formation Light
Blue Formation Light
White Tail Illuminating Light
Blue Starboard Position Light
Red Anti-Collision Beacon (On Fuselage Spine)
Blue Formation Light
Red Port Position Light
Taxi Light
Landing Lights (2)
Red Anti-Collision Beacon



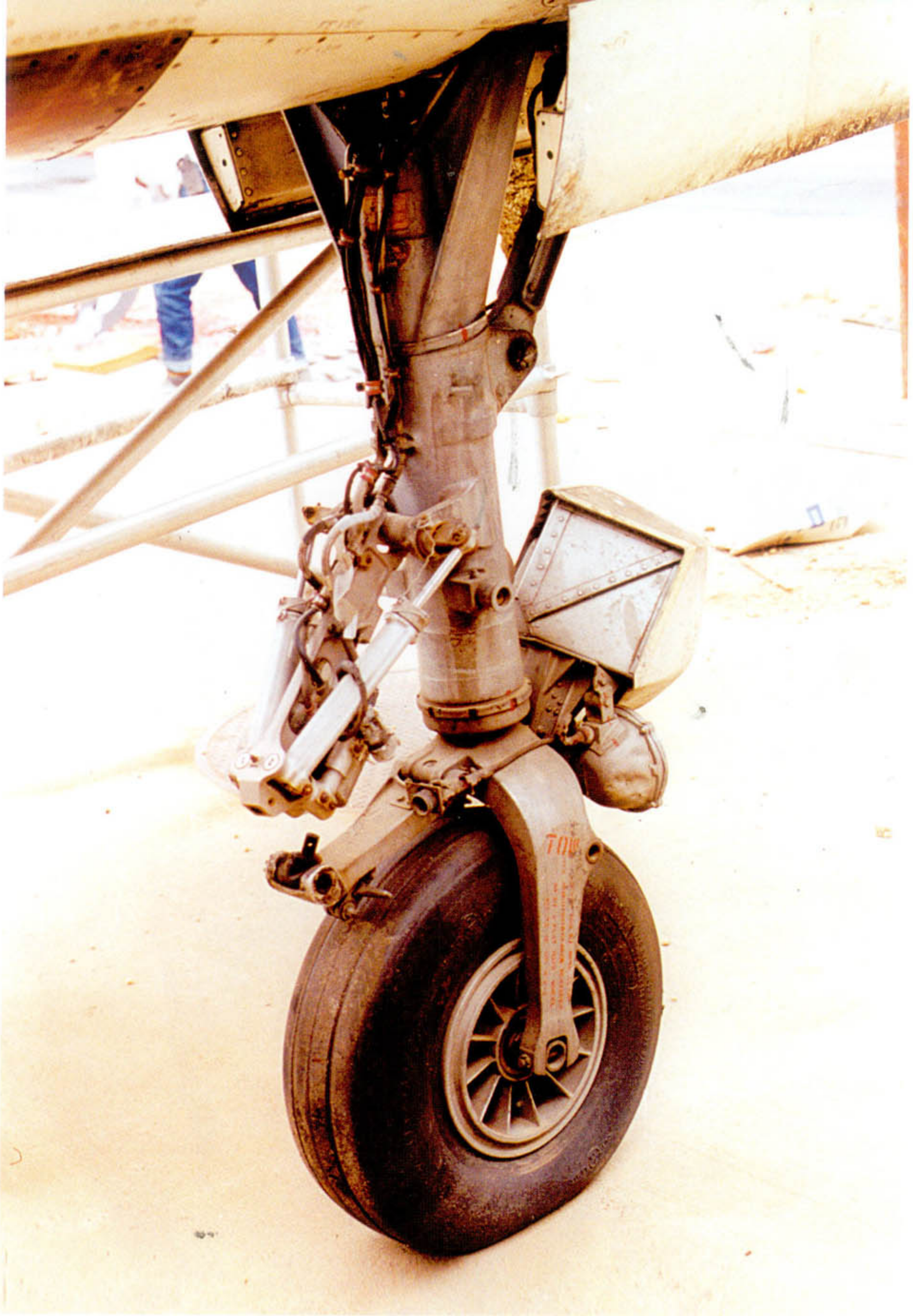
One of the F-105's two red anti-collision beacons is mounted ahead of the nose landing gear; the other beacon is placed on the upper fuselage. The anti-collision lights rotate at 80 revolutions per minute to warn nearby aircraft of the Thunderchief's presence at night and in bad weather. The pilot may activate either anti-collision beacon separately, both lights simultaneously, or turn both lights off. (Phillips)



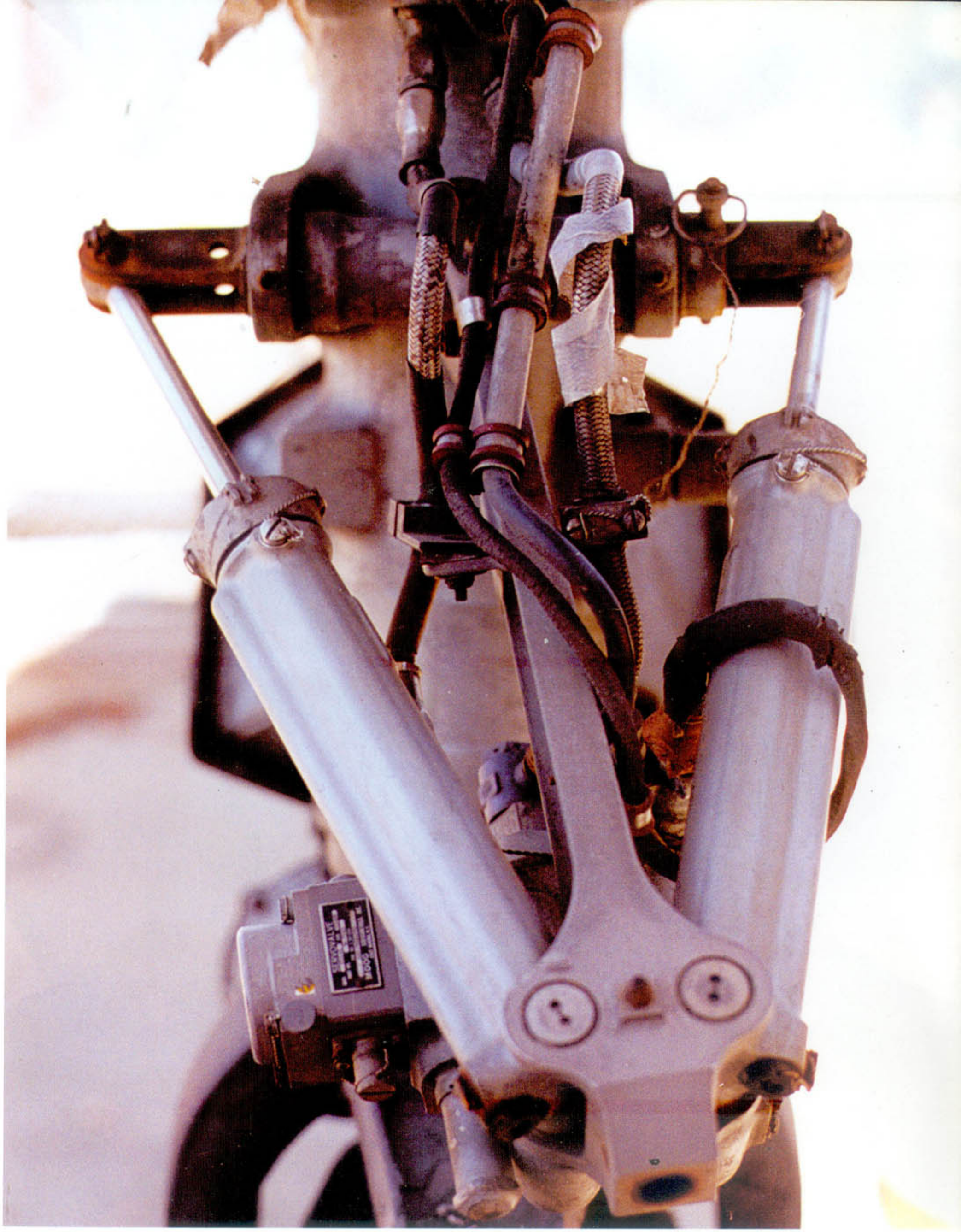
The F-105's nose landing gear remained the same for all Thunderchief variants. The landing gear retracted forward under hydraulic power into the nose gear bay. The y-shaped yoke inside the nose gear bay formed the upper portion of the nose landing gear strut. Late in their service careers, many F-105s had their landing gears and wheel wells painted gloss white. (Phillips)



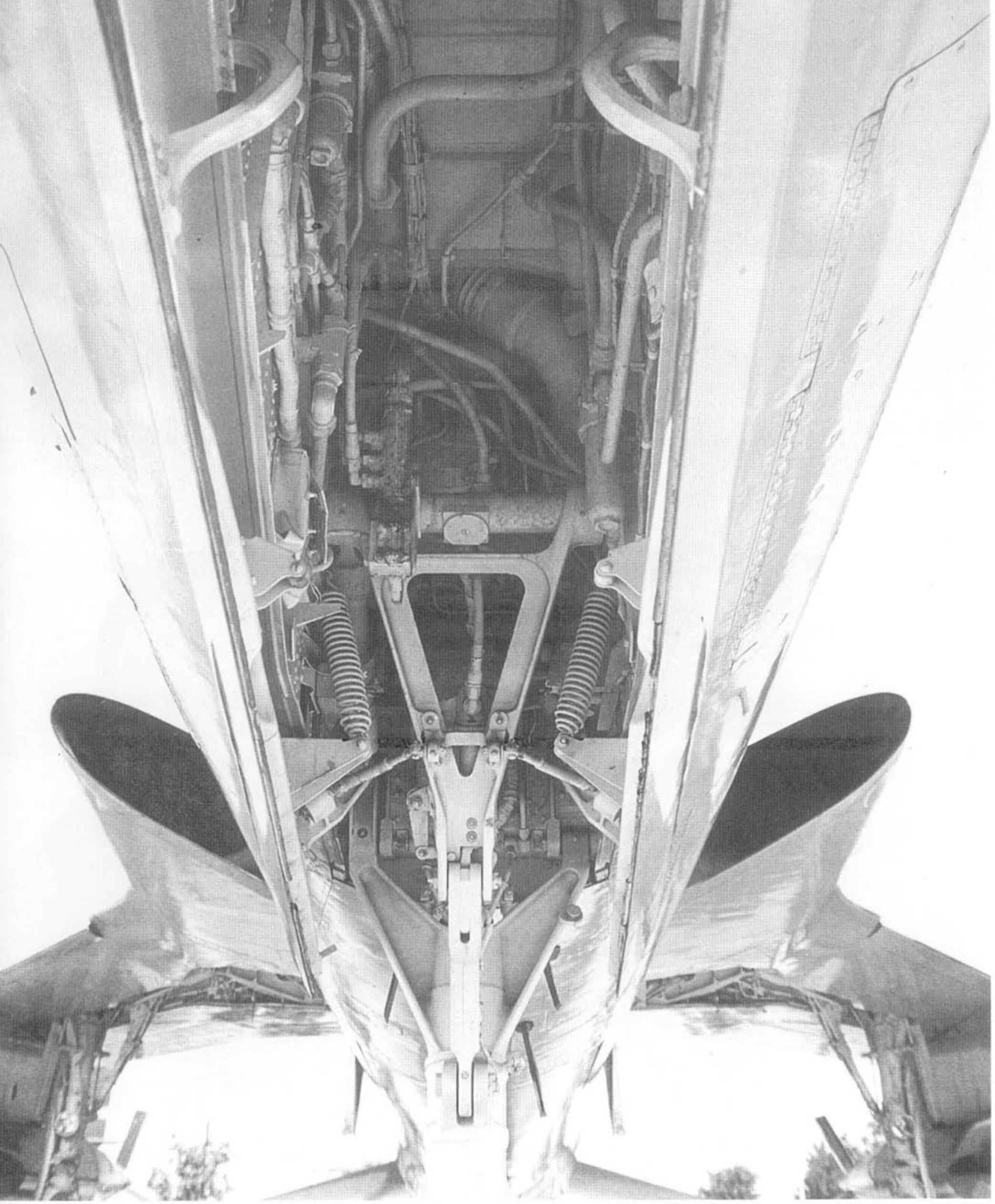
Two landing lights were mounted on either side of the nose gear strut, which provided forward lighting for the pilot while landing and taxiing the aircraft. A protective cover, often painted with the last three digits of the F-105's serial number, was placed over the Instrument Landing System (ILS) reflector. The ILS reflector received glide slope information for assisting the pilot in night and bad weather landings.



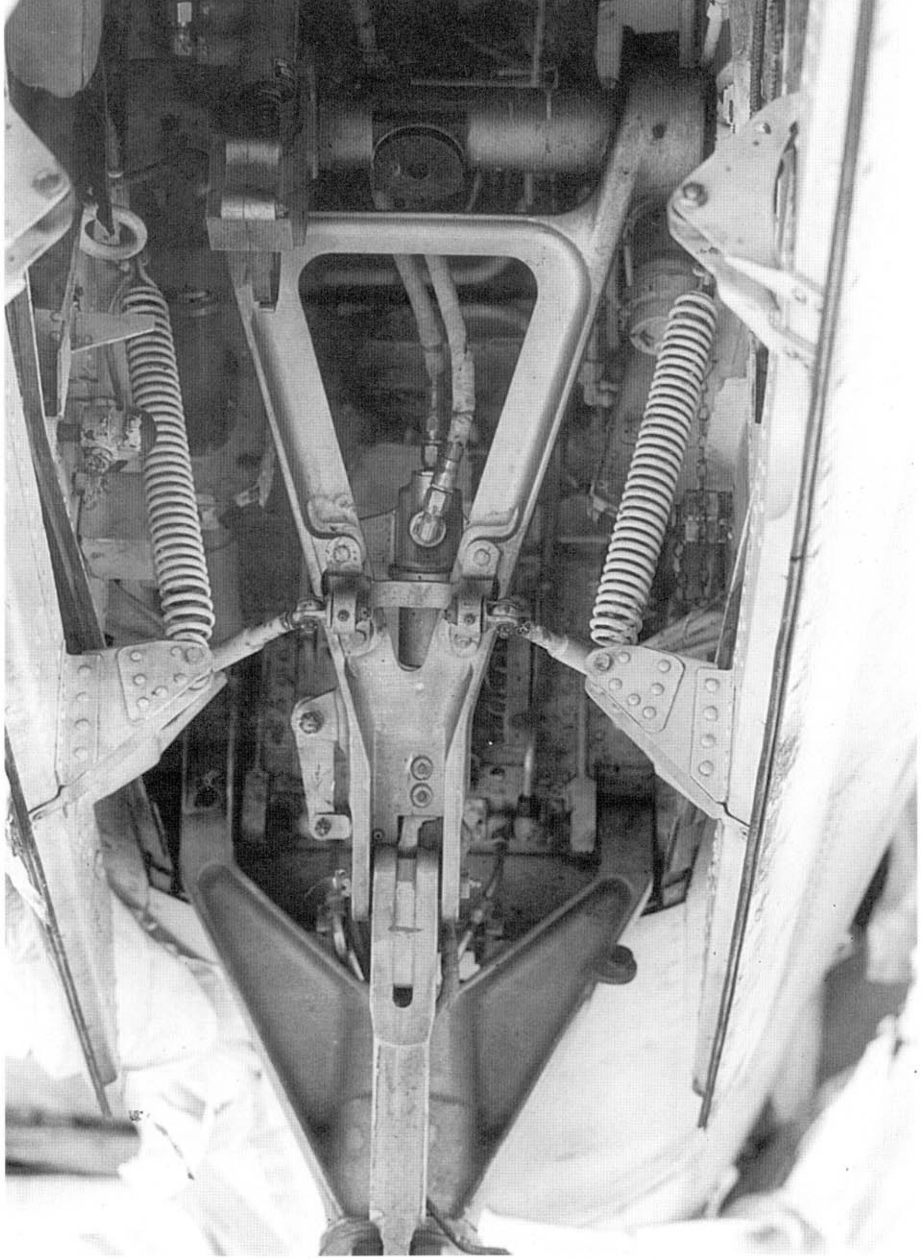
The nose gear torque links were routinely disconnected when the aircraft was on the ground, which allowed towing with the nose wheel in a free swivel mode. The towing bracket was attached to the hole in front of the word 'TOW' on the wheel fork. A small pad at the end of the lower torque link stopped the spinning wheel during retraction.



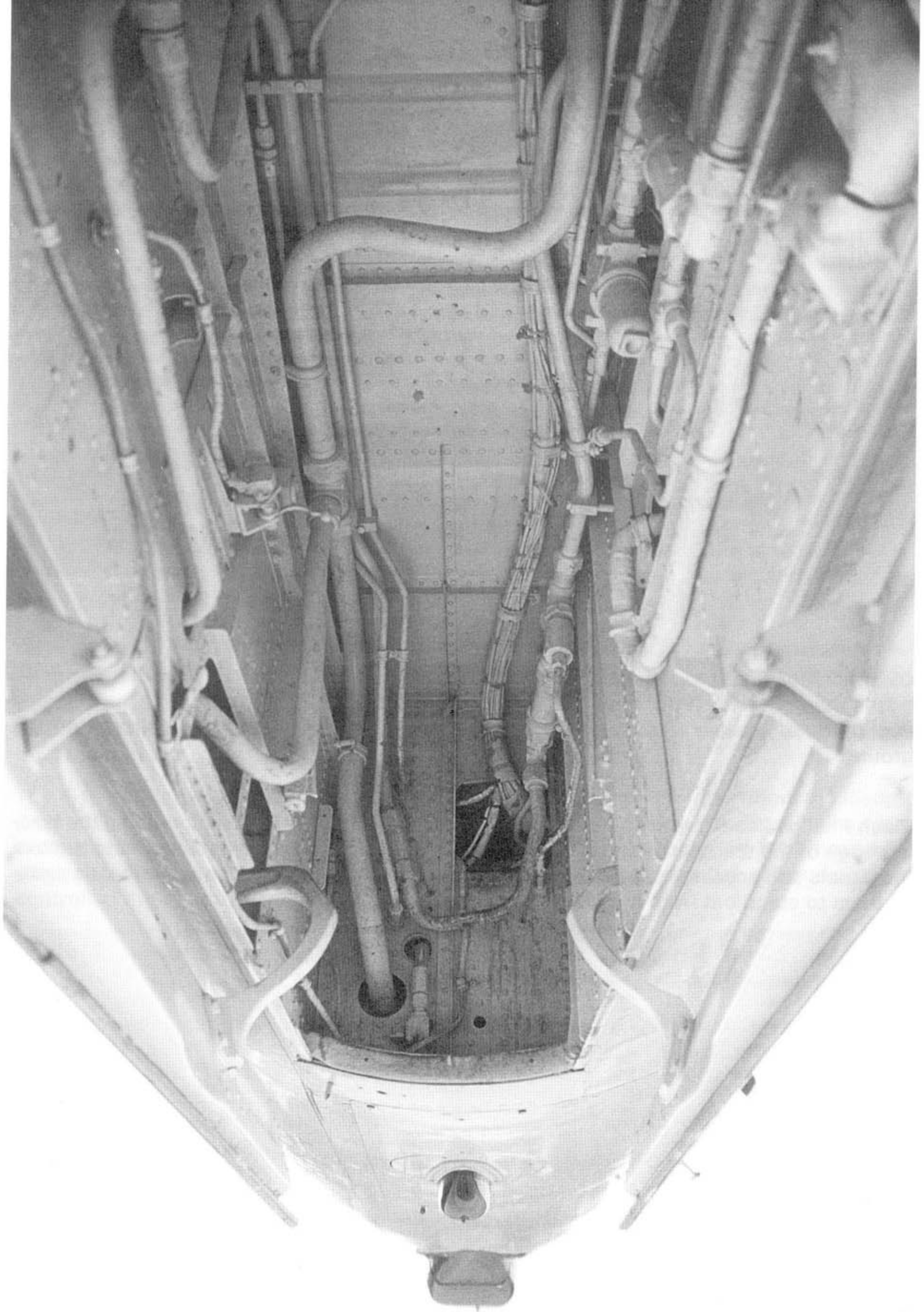
Moog Industries produced the F-105's nose wheel steering hydraulic actuators and servo valve. Nose wheel steering was used during taxi, but normally disengaged at 60 knots (68.9 MPH/110.9KMH) during takeoff. This was approximately the speed at which the rudder became effective.



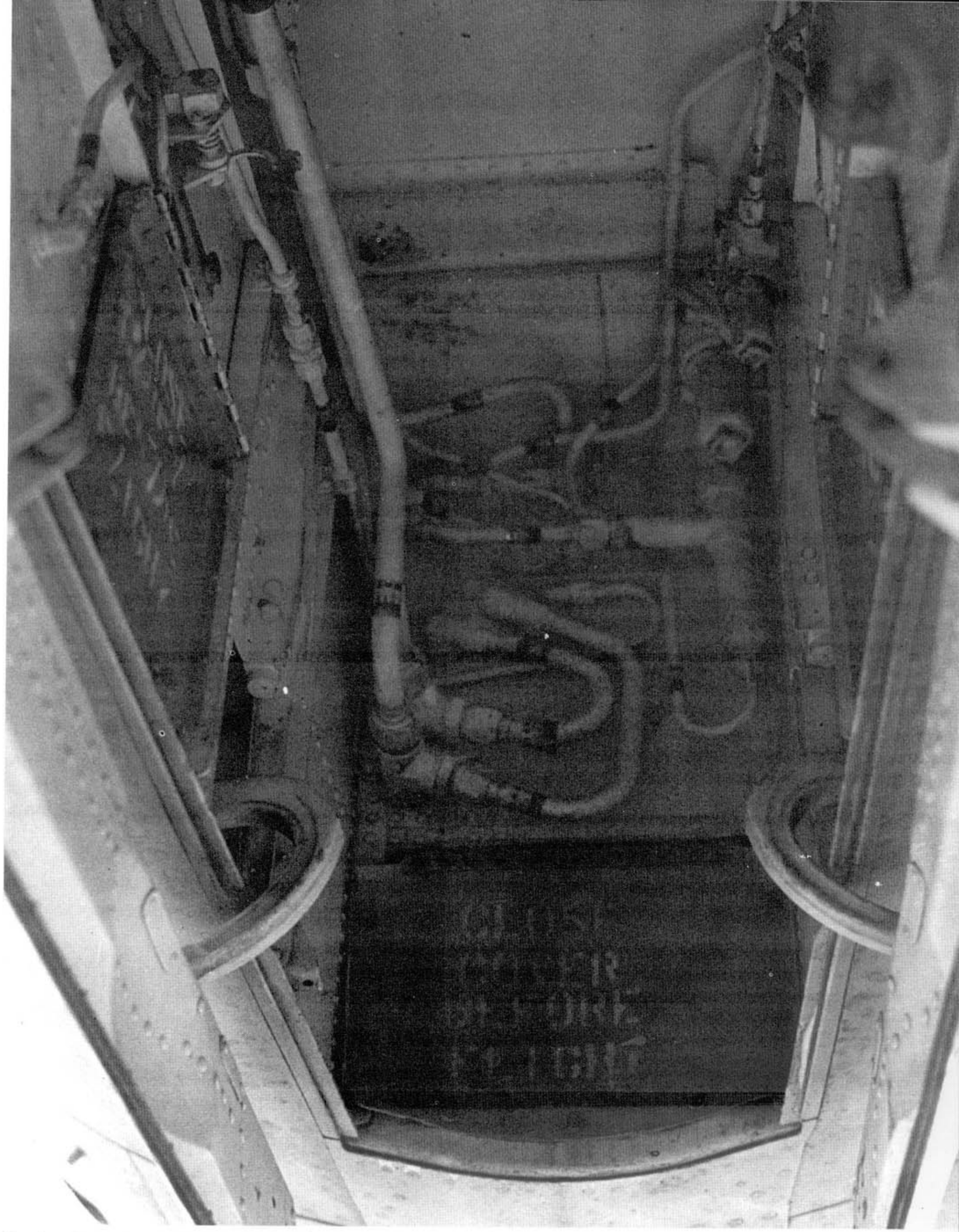
Hydraulic and electrical lines snaked through the F-105's nose landing gear bay. These lines carried hydraulic fluid and electrical power to the nose landing gear and other equipment in the forward portion of the aircraft. The landing gear was mounted at the aft portion of the bay with a y-shaped yoke at the top. The curved hinges attached to the nose landing gear doors allowed the door to close on gear retraction. (Phillips)



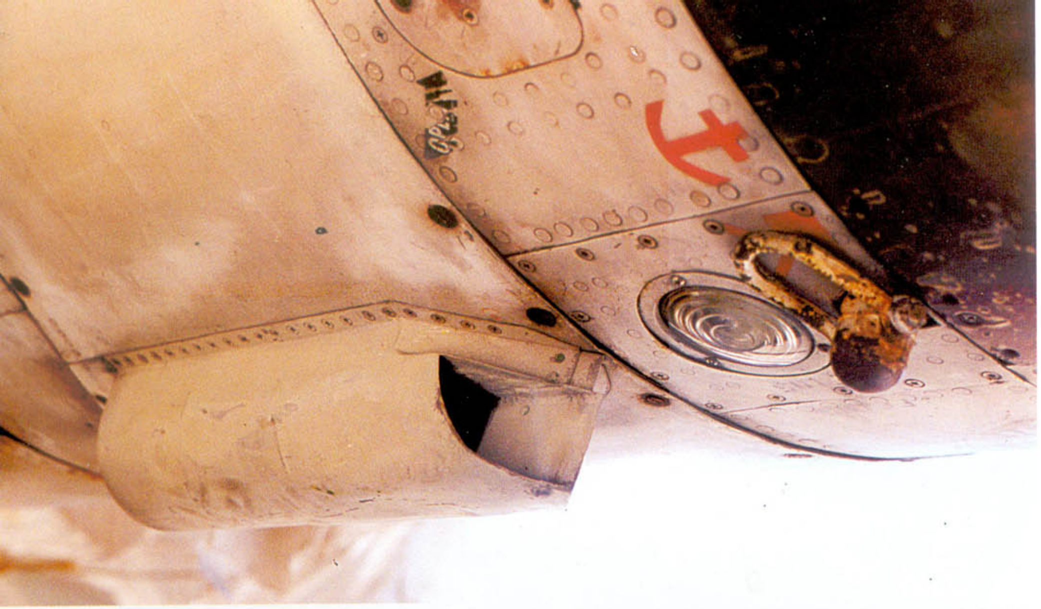
The upper portion of the nose gear strut consisted of a y-shaped yoke mounted at the aft end of the gear bay. The nose gear retraction arm was mounted forward of the main strut. A hydraulic ram, mounted at left, pulled the retraction strut forward, which, in turn, pulled the main strut up into the well. Springs attached to the landing gear doors assist in operating these doors simultaneously with the landing gear.



Hydraulic and electrical lines passed along the nose landing gear bay and ran through the forward bulkhead into the nose of the later F-105D. Flanges connected the landing gear doors to the door retraction mechanism, which pulled the doors closed. The F-105's landing gear retracted in approximately four to eight seconds and extended in approximately five to nine seconds. (Phillips)

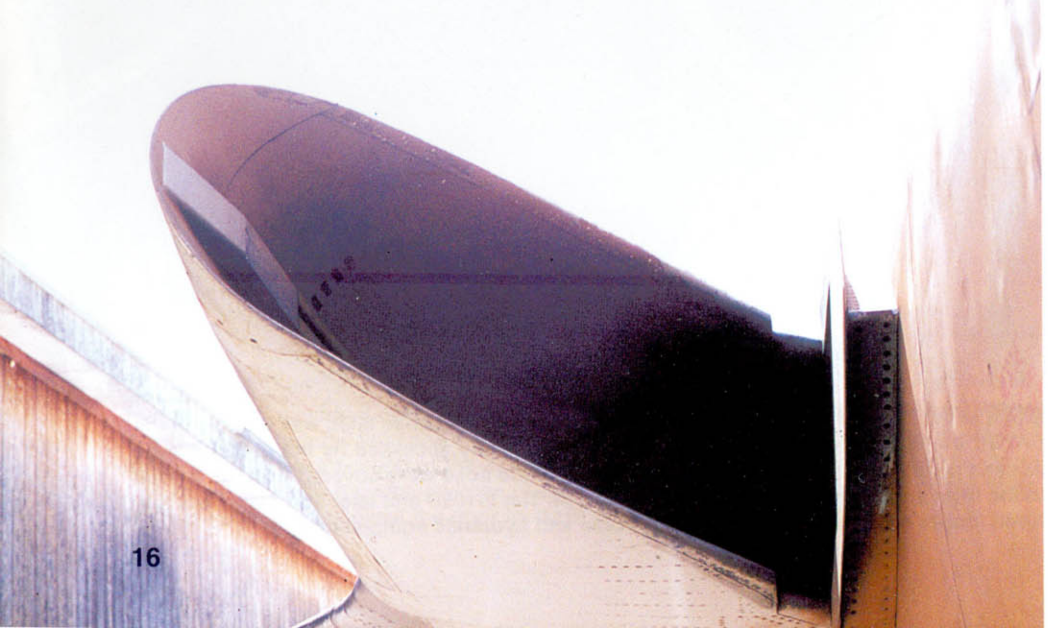


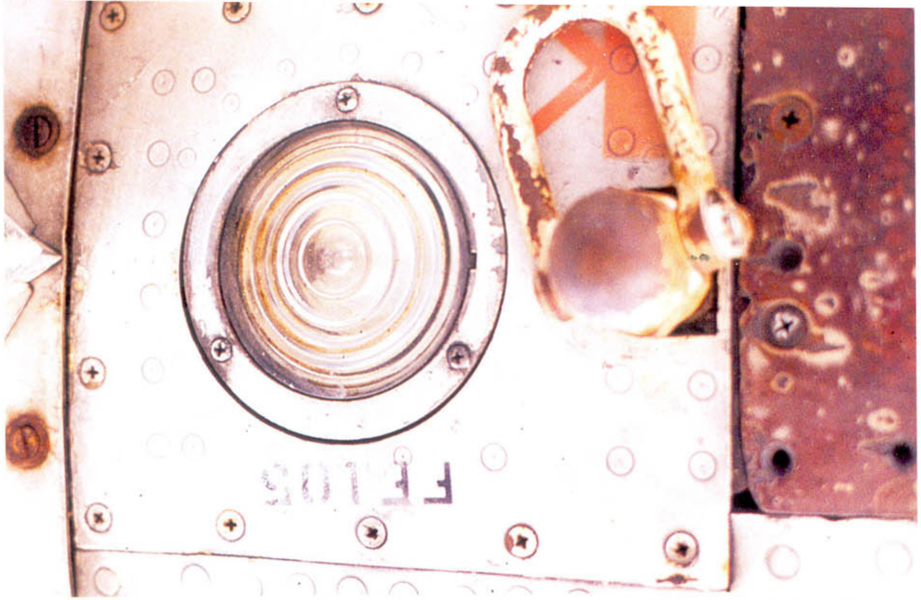
Much of the internal plumbing for various landing gear hydraulic lines was located in the F-105B's nose landing gear well where it could be easily accessed by the groundcrews. Access panels for electronic equipment placed in the nose were covered with red panels at the front and along the sides of the wheel well. The F-105D and later Thunderchiefs featured longer noses and rearranged electronic and hydraulic equipment.



The cooling duct for the avionics compartment is located under the fuselage immediately forward of the bomb bay. Avionics generated considerable heat when used, requiring cooling air to ensure its normal operation. A white position light is placed just ahead of the cooling duct, with the aft edge of the AN/APN-131 Doppler navigation antenna ahead of the light.

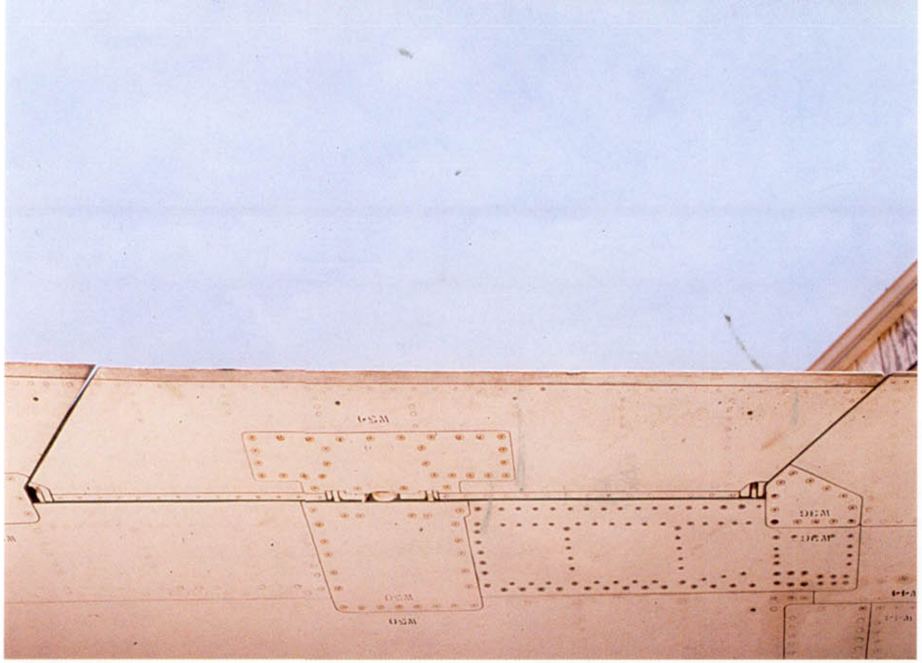
Air for the F-105's Pratt & Whitney J75 turbojet engine was supplied by air intakes mounted at the wing roots. The boundary layer splitter plate, mounted parallel to the fuselage side, directed air into the intake. Air passed through the intake to reach the J75 engine's compressor.





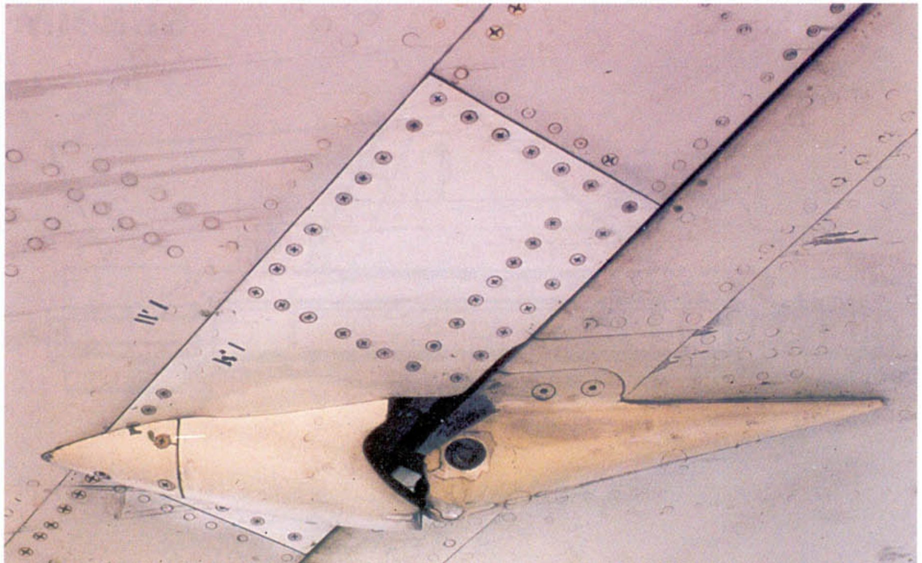
Clear position lights were located on the top, bottom, and sides of the forward fuselage — this is the underside light, mounted behind the tie down ring and in front of the avionics cooling duct. A cable was attached to the tie down ring for securing the aircraft on the ground.

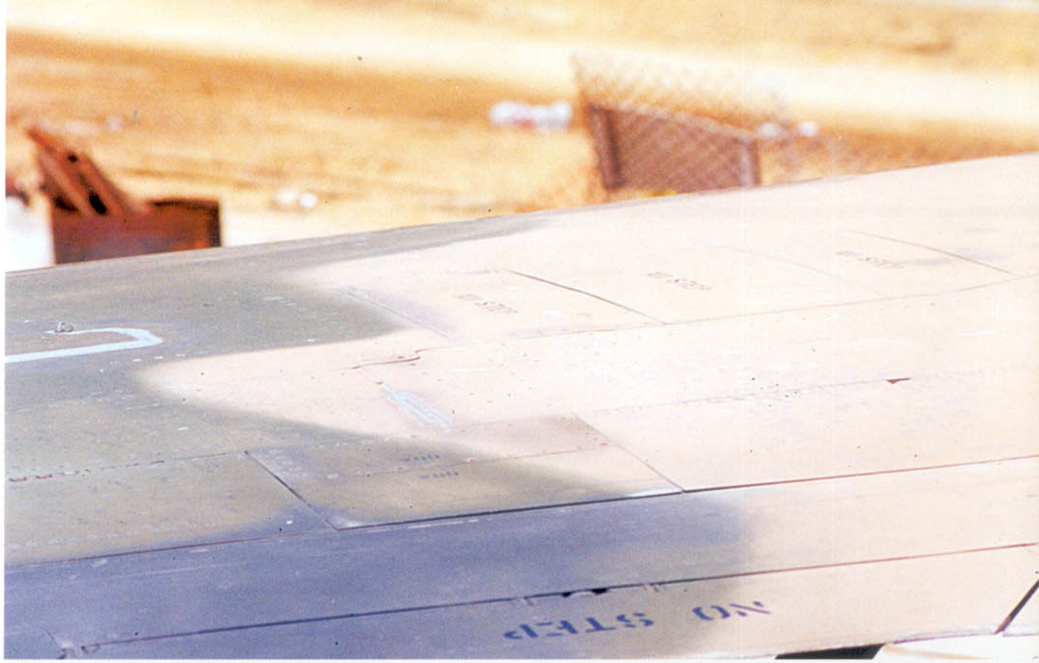
Flush Phillips head screws fastened the various panels to the airframe, including the leading edge of the starboard wing. These screws allowed maintenance personnel to remove the panels and access equipment located inside the wing. Wear on the screw heads causes them to stand out from the rest of the airframe.



Each F-105 trailing edge flap has a trim tab fitted to the center aft section of the flap. The trim tab is connected to the wing by four hinge points: one at each end, and two in the middle. The pilot sets the trim tab position to achieve the desired 'hands-off' attitude of the Thunderchief.

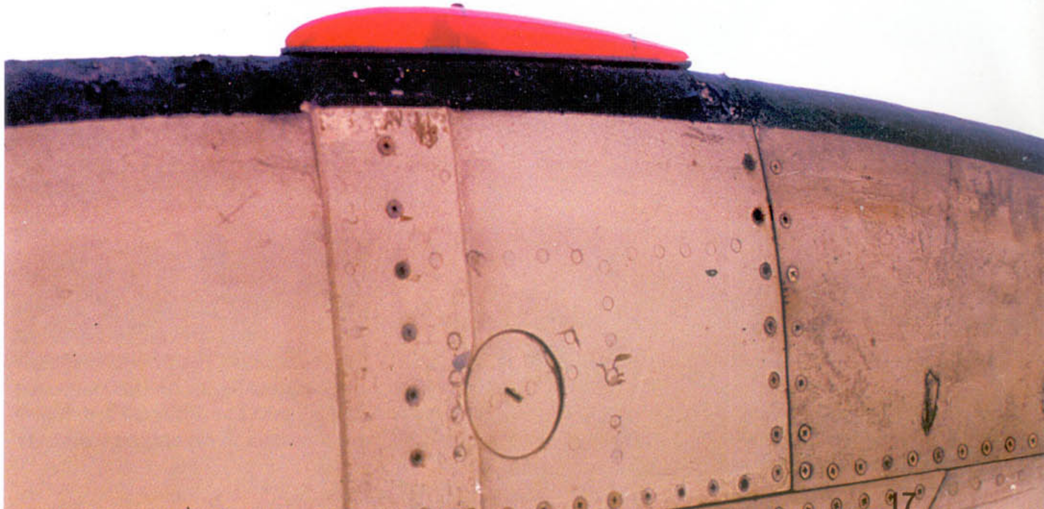
The F-105's aileron control rod was located inside a streamlined fairing where the leading edge of the aileron met the wing. The forward portion of the fairing was fixed to the wing, while the aft section moved up and down with the aileron. The hinge control moved the aileron up or down according to inputs sent from the pilot's control stick. Aileron position controlled the aircraft's roll and aided in turning the Thunderchief.

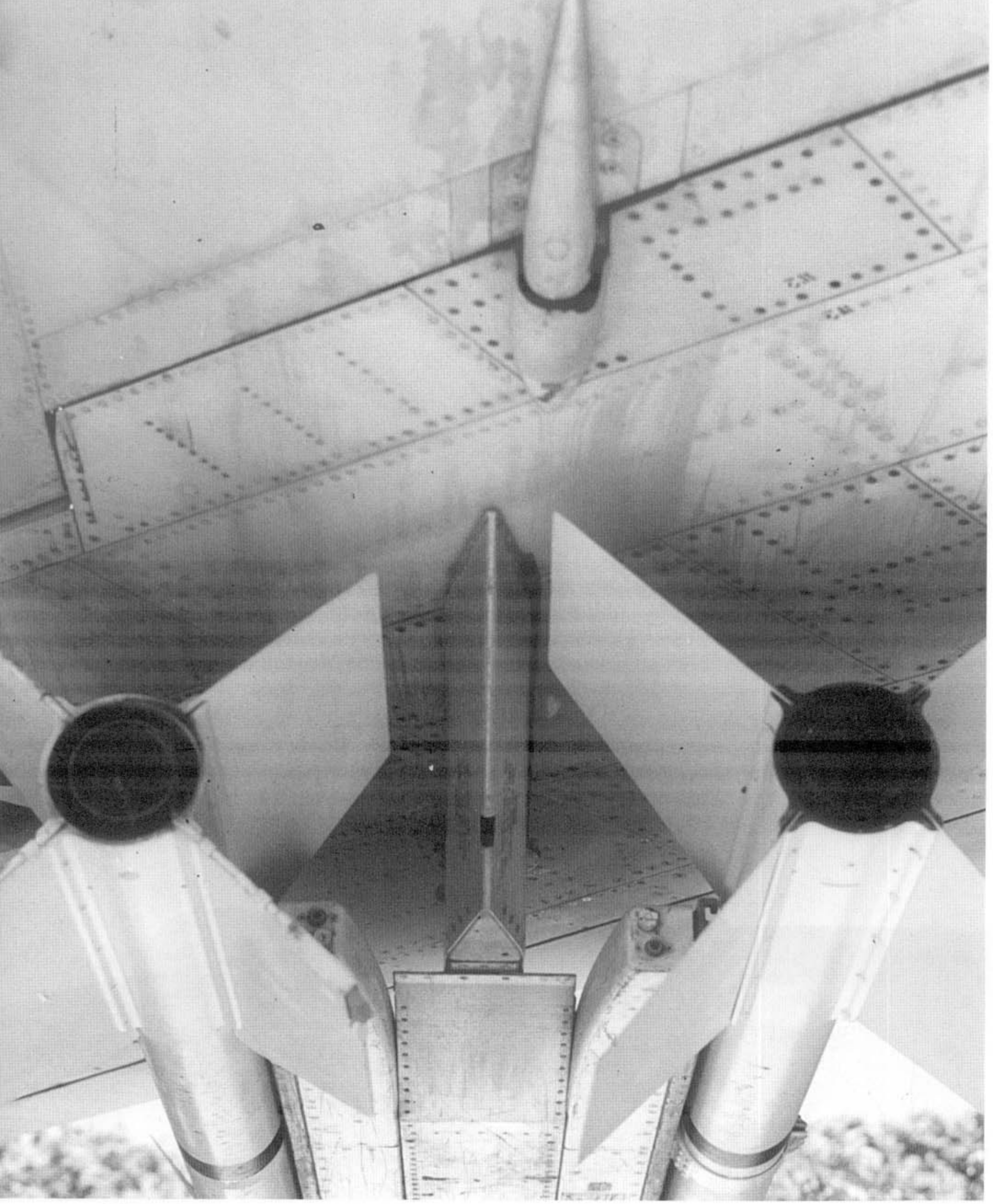




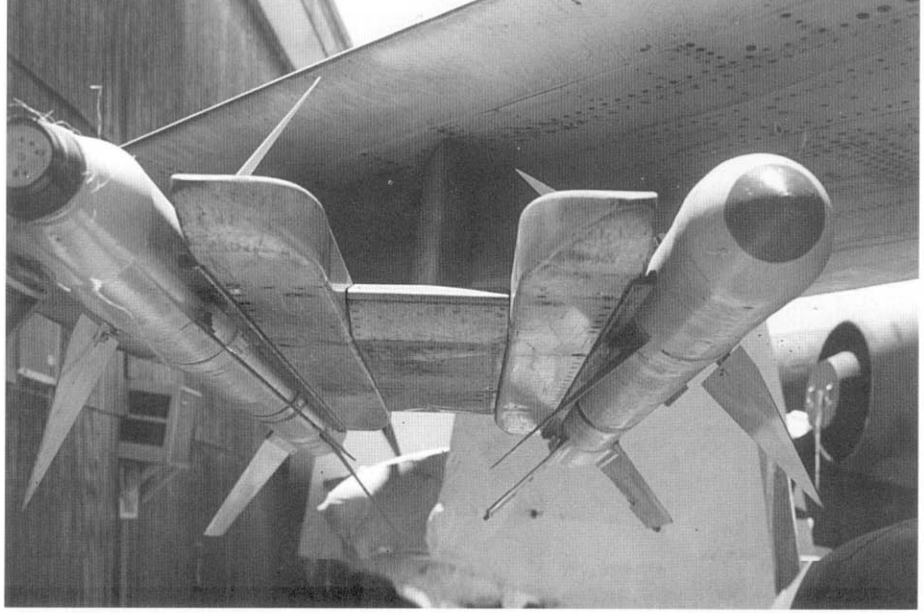
The phrase NO STEP is stenciled on the upper surface of the port wing flap trim tab as a warning to ground personnel. Ahead of the flap's leading edge are two of the five section spoilers fitted to each upper wing. The spoilers were primarily used on touchdown to help slow down the aircraft and reduce lift; however, spoilers were also used in flight to help control the F-105's roll.

A red position light was located on the port wingtip. A blue light was mounted on the starboard wingtip, while a white light was mounted on both sides of the vertical fin tip. The lights could be set OFF, FLASH, or STEADY via a switch in the cockpit.



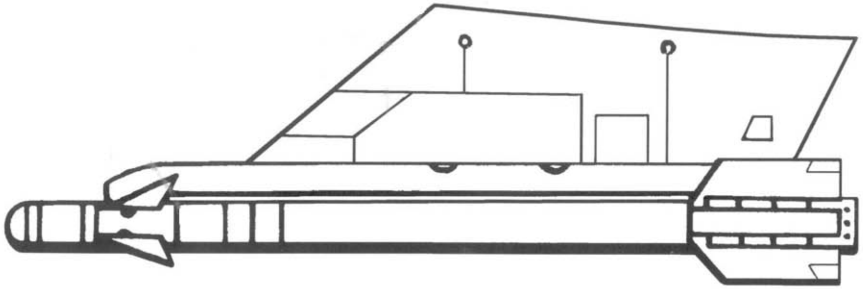


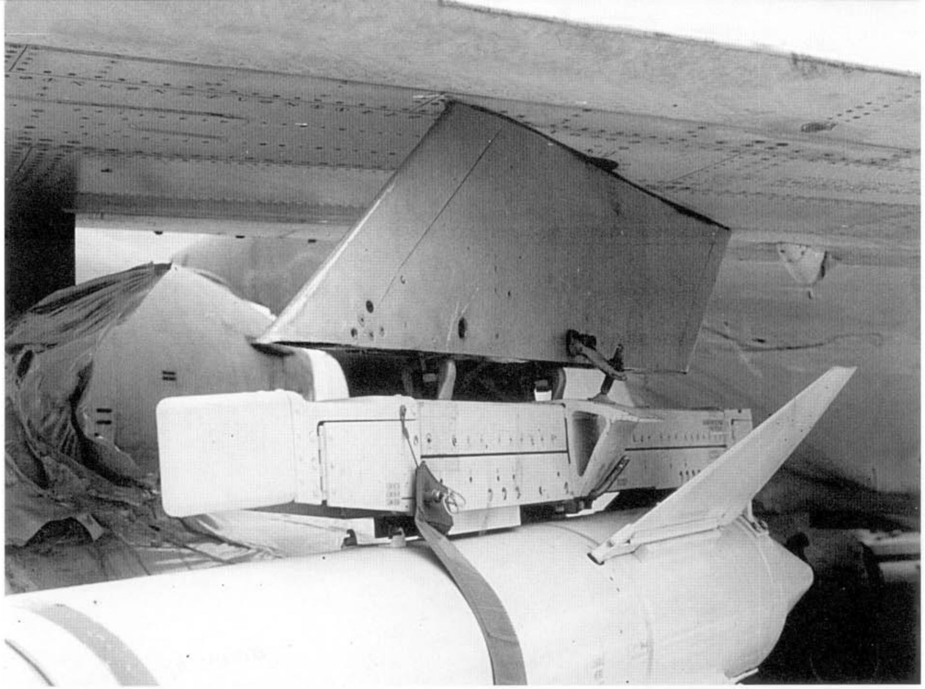
The twin missile rack securely fitted to this F-105B's outboard wing pylon was not normally fitted to Thunderchiefs. F-105s usually carried only single AIM-9s on the outboard pylons. An aileron control fairing is mounted behind the pylon. The Philco-Ford AIM-9 Sidewinder is a heat-seeking Air to Air Missile (AAM), which homes in on engine exhausts and other large heat sources.



Two AIM-9 Sidewinder AAMs could be mounted on the F-105B's outboard wing pylon. The missiles were placed on a twin-launcher, which was attached to the pylon. A Thunderchief could carry up to four Sidewinders for self-defense against enemy fighters. This mount allowed the inboard wing pylons to be used for carrying fuel tanks for long-range missions or various weapons for short-range missions. The Sidewinder travels at a maximum speed of Mach 2 and has a sea level range of 3608 feet (1082 M). The AIM-9B version used on F-105s entered operational service during 1956.

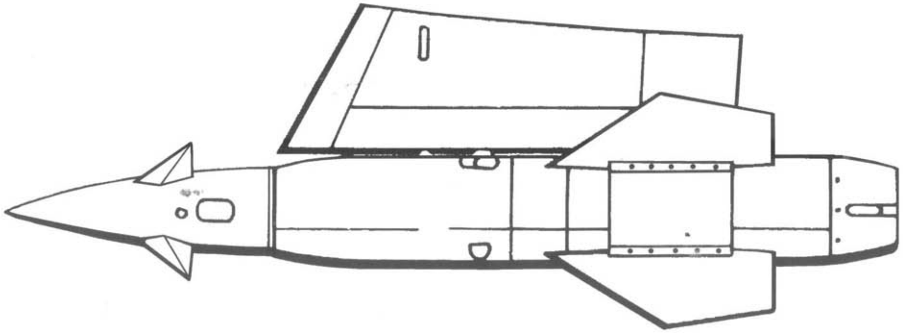
AIM-9 Sidewinder Air-to-Air Missile

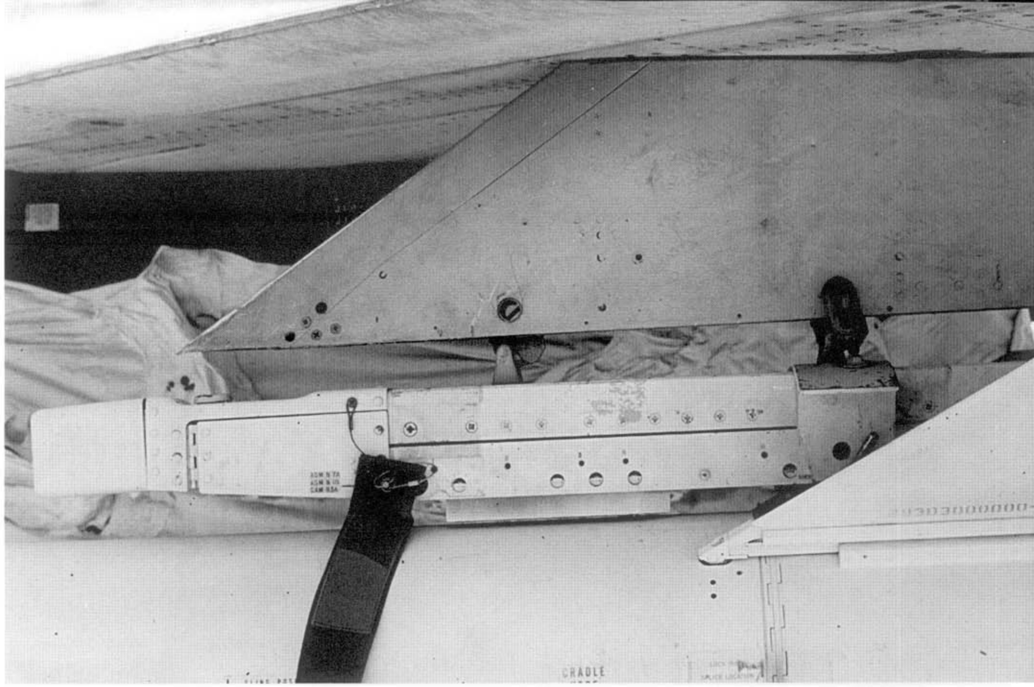




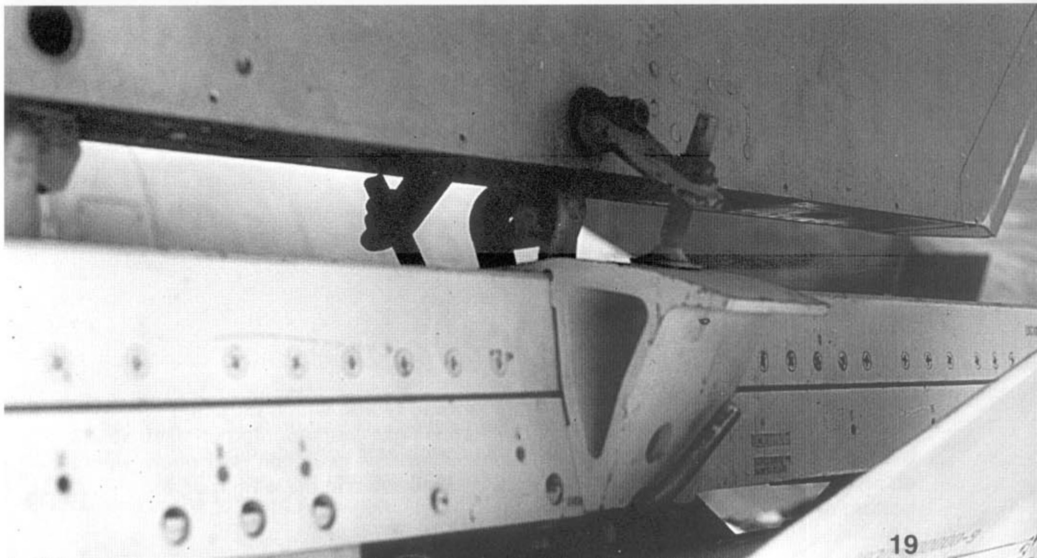
The Martin/Maxon AGM-12 Bullpup and other Air to Surface Missiles (ASMs) were attached to the F-105's inboard wing pylons via a missile launch rail. The launch rail included electrical connections with the cockpit, from which the pilot launched the weapon. A red REMOVE BEFORE FLIGHT flag is attached to a ground safety pin fitted to the rack's forward portion.

AGM-12 Bullpup Air-to-Surface Missile

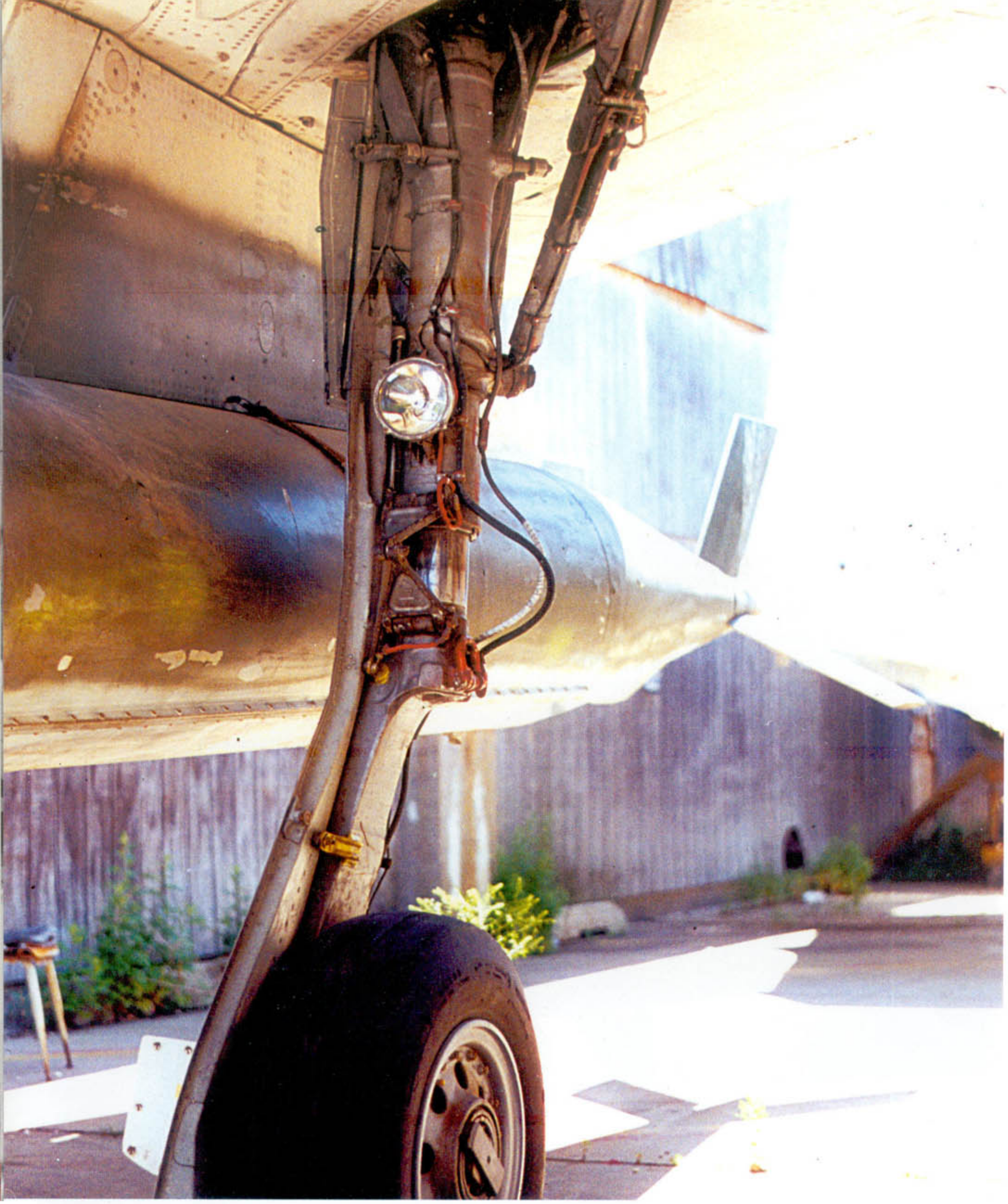




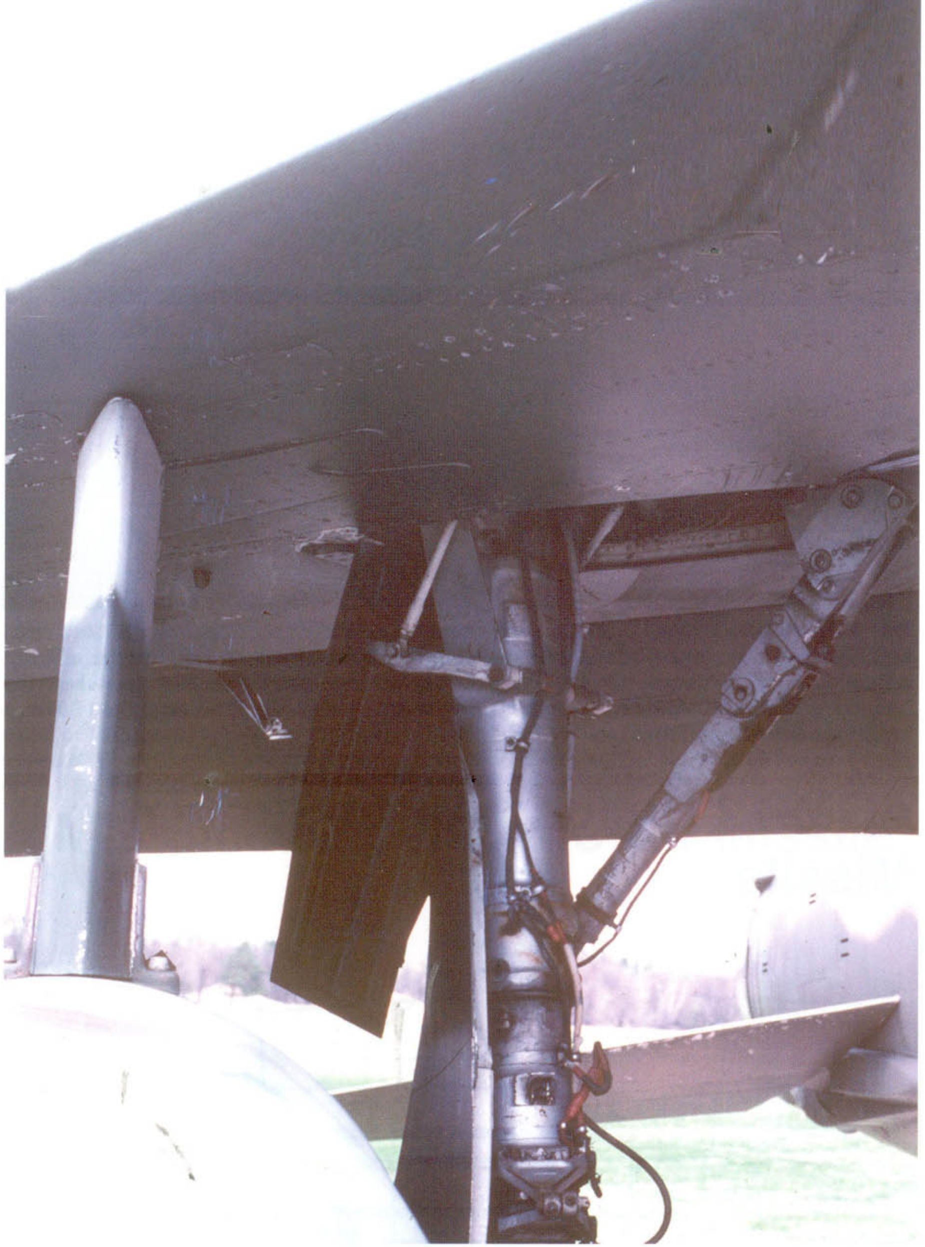
The missile launch rail is attached to the inboard wing pylon through a series of fasteners and clamps. Bolts used to secure the rack to the pylon were fitted within two holes located at the pylon's bottom edge. The pylons were attached to the wing by a post mounted in the center of the pylon's upper edge into the wing hardpoint. The inboard wing pylon could carry fuel tanks, bombs, or missiles.



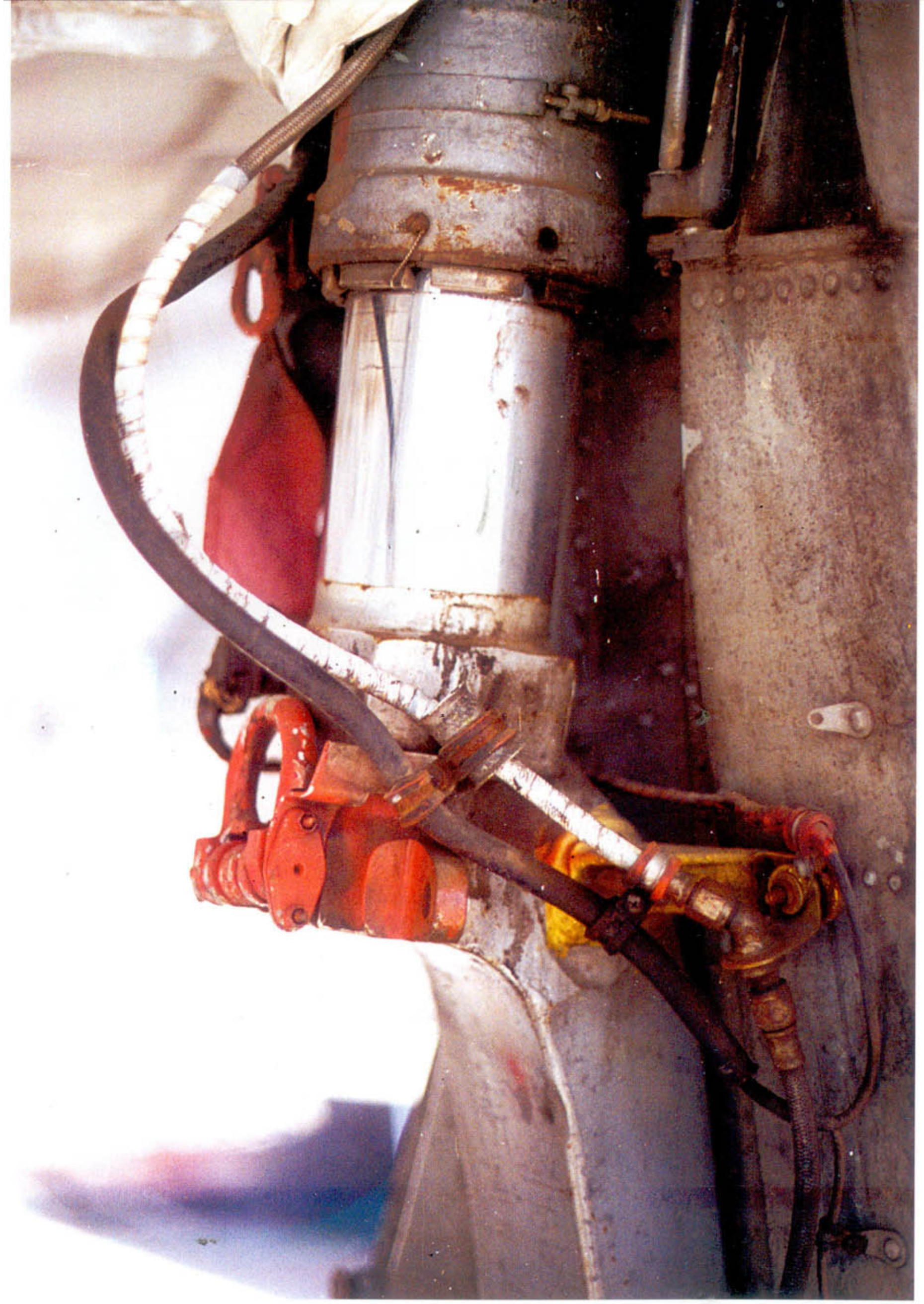
Bolts and sway braces secure the missile launch rail to the aft pylon attachment point. Explosive charges placed inside the pylons can be triggered by the pilot to jettison external stores during an in-flight emergency. The pylons may also be jettisoned to lighten a damaged aircraft for an emergency landing.



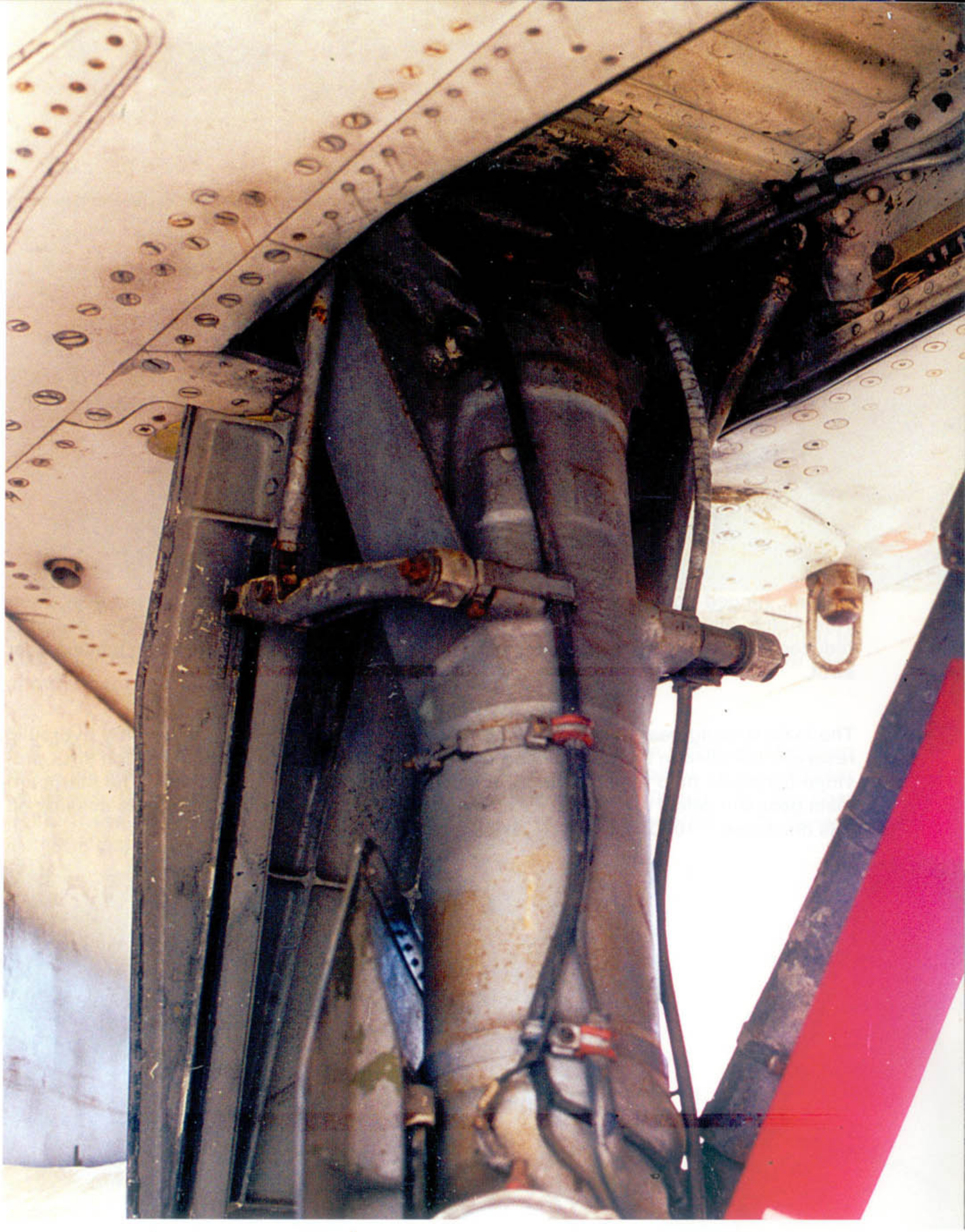
The F-105B was equipped with two main landing gears, which retracted inward and forward into the lower wing surfaces. A single taxi light was mounted on each strut to light the taxiway for the pilot at night or in bad weather. The two main gear doors were mounted on the outside of the strut. A third door was mounted at the wing root and enclosed the bottom of the wheel and tire.



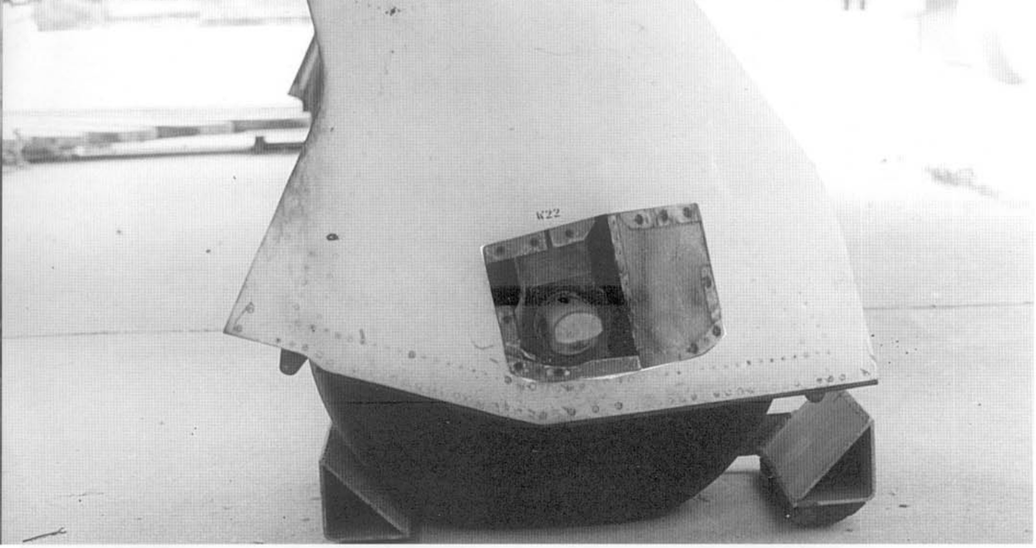
The main landing gear retraction strut connected the middle of the main gear strut with the gear retraction mechanism in the wheel well. The Fowler flap mounted on the wing trailing edge extended rearwards and downwards to initially produce a large increase in lift. The flaps offered high lift and drag for landing when fully lowered. (Curtiss Knowles)



The F-105B's Bendix main landing gear struts incorporated an air shock absorber (oleo) and a single wheel fork below the oleo. Hydraulic lines for the wheel brakes run down the side of the strut and the inner gear door surface. The main gear struts were beefed up for the later — and heavier — F-105D through G models.

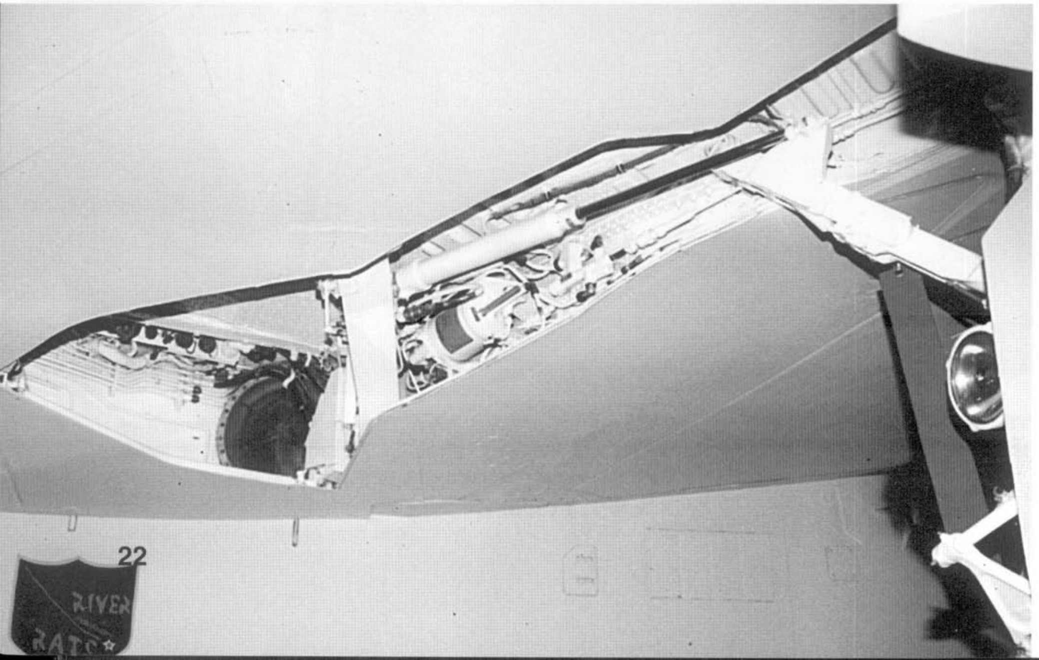


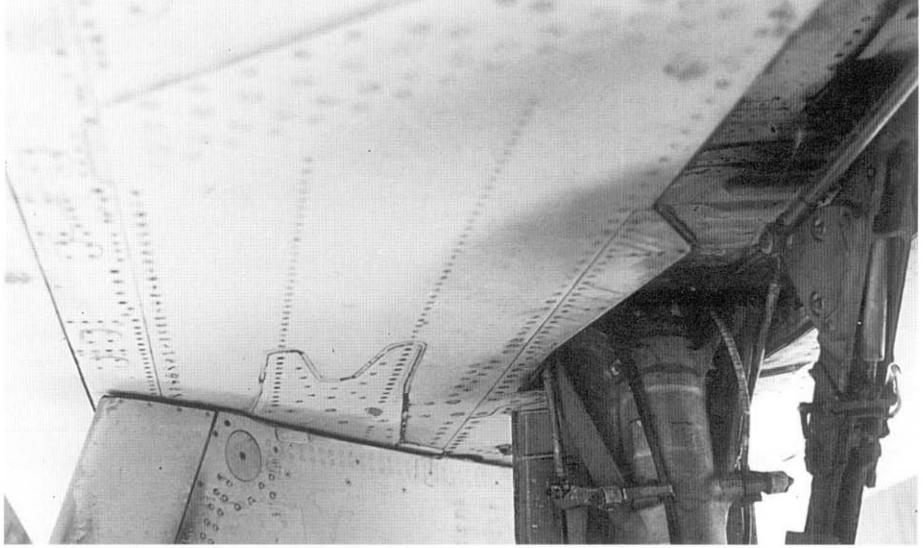
The main landing gear pivoted inwards on a V-shaped yoke. The small door outboard of the strut covered the hinging point when the gear was retracted. The main and nose landing gear retraction sequence took from four to eight seconds, while the extension ranged from five to nine seconds. The landing gear was retracted using the utility hydraulic system mounted in the forward fuselage.



A small, hinged door was set in to the lower end of the F-105's main landing gear door. This hatch allowed maintenance access to the main wheel bearings. The bearings reduced friction and wear on the main wheels where they fitted into the main landing gear strut.

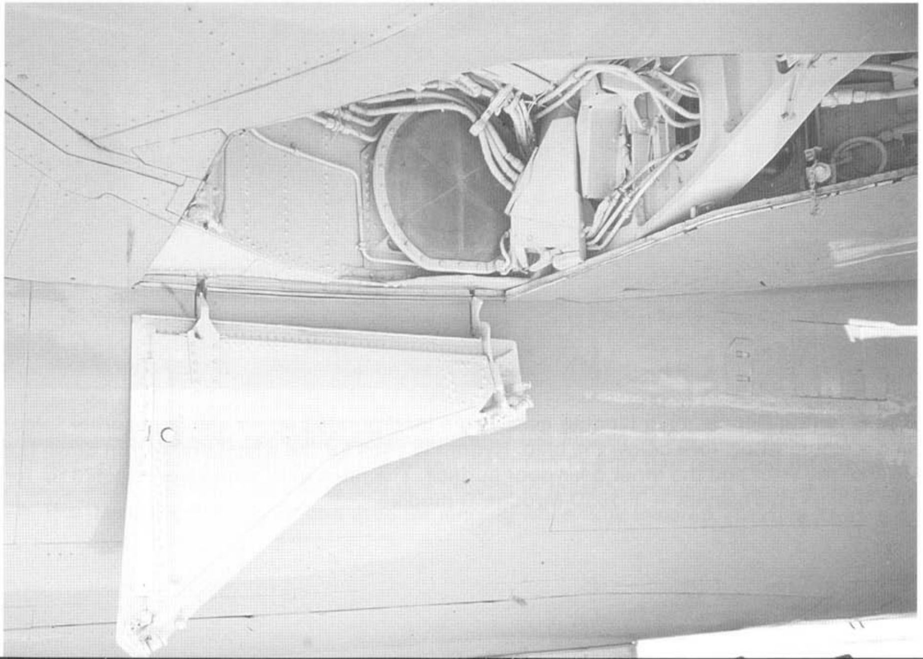
The main landing gear fully retracted into the wing undersurfaces. The primary hydraulic reservoir installed in the port landing gear well under and behind the retraction strut provided hydraulic fluid for operating the landing gear and control surfaces. The starboard main gear and wheel well layout was similar. The inboard landing gear door is missing on this displayed F-105D. (Dennis R. Jenkins)

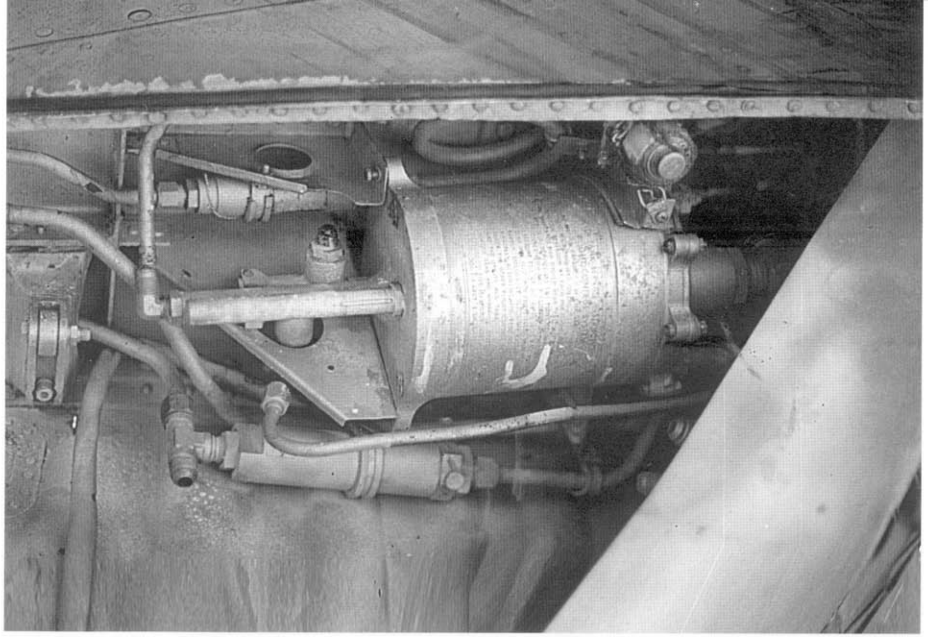




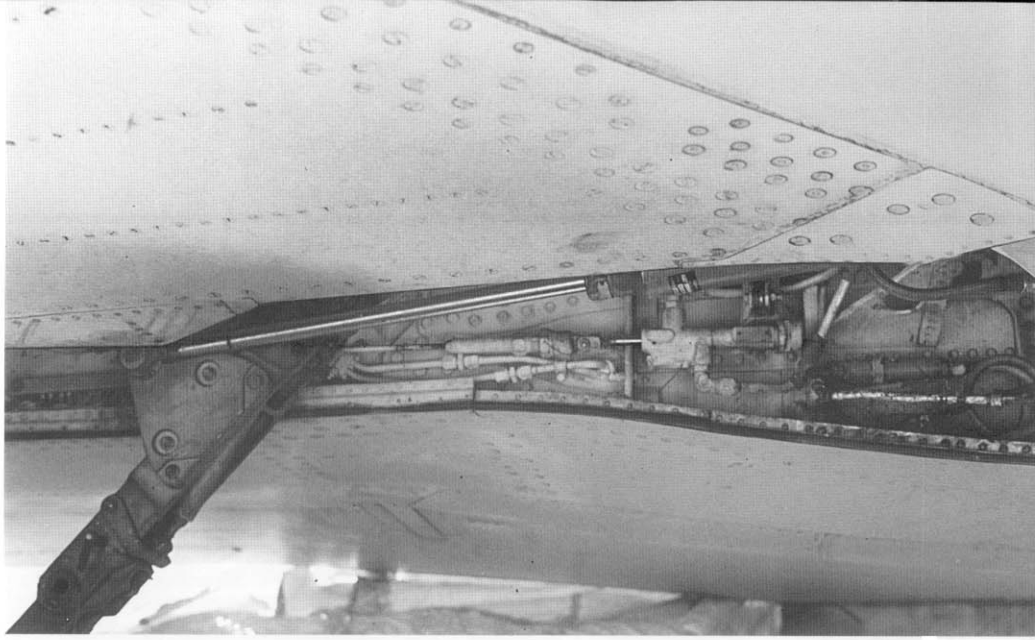
The inboard wing pylons were mounted outboard of the main landing gear and were used to carry fuel tanks and various weapons, including missiles, bombs, and rocket launchers. The pylon was secured to a hardpoint in the wing undersurface.

The inboard main landing gear door extended down at a 90° angle, with the wide end facing forward. The circular object inside the wheel well is a secondary air intake for supplying air to the engine while the F-105 was on the ground. During the late 1960s, F-105 wheel wells and landing gears were painted Gloss White, which allowed ground crewmen to better detect leaking fluids. (Phillips)



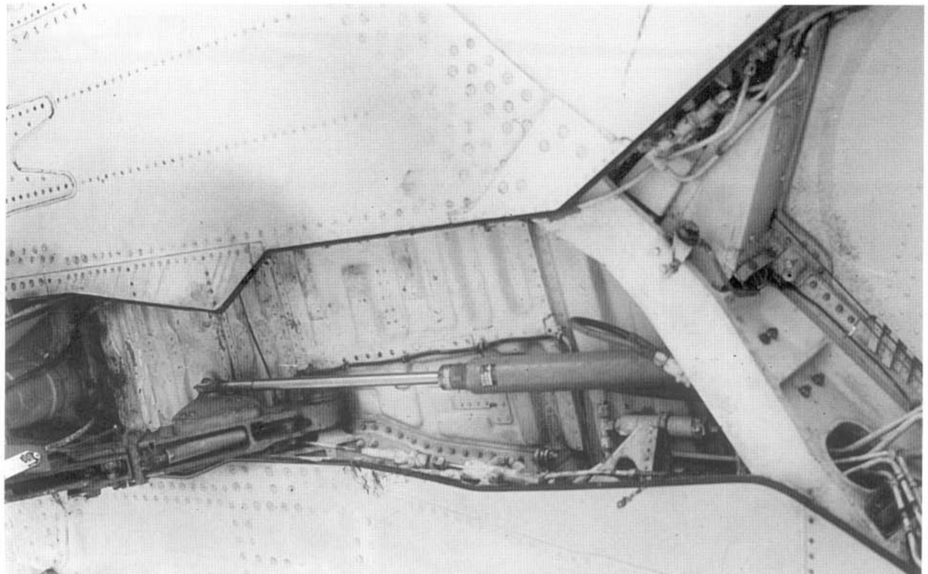


The primary one hydraulic reservoir was a small cylindrical tank mounted against the rear wall of the port main strut well. The F-105 employed three hydraulic systems: utility, primary one, and primary two. The two primary systems were used to operate the flight controls and were redundant — each system could operate the controls in the event the other was damaged. The utility hydraulic system was used to operate all other hydraulically operated systems.

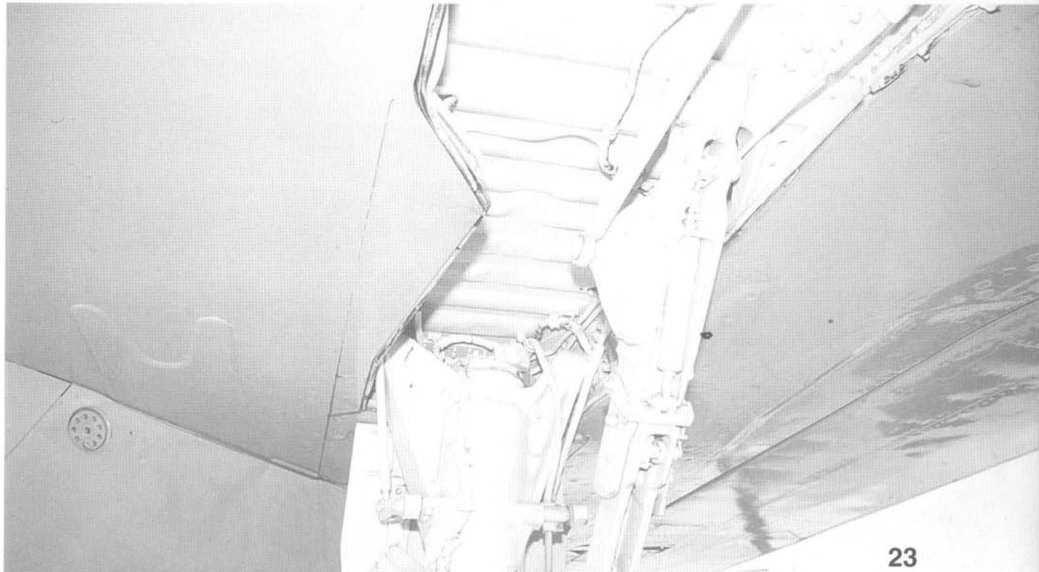


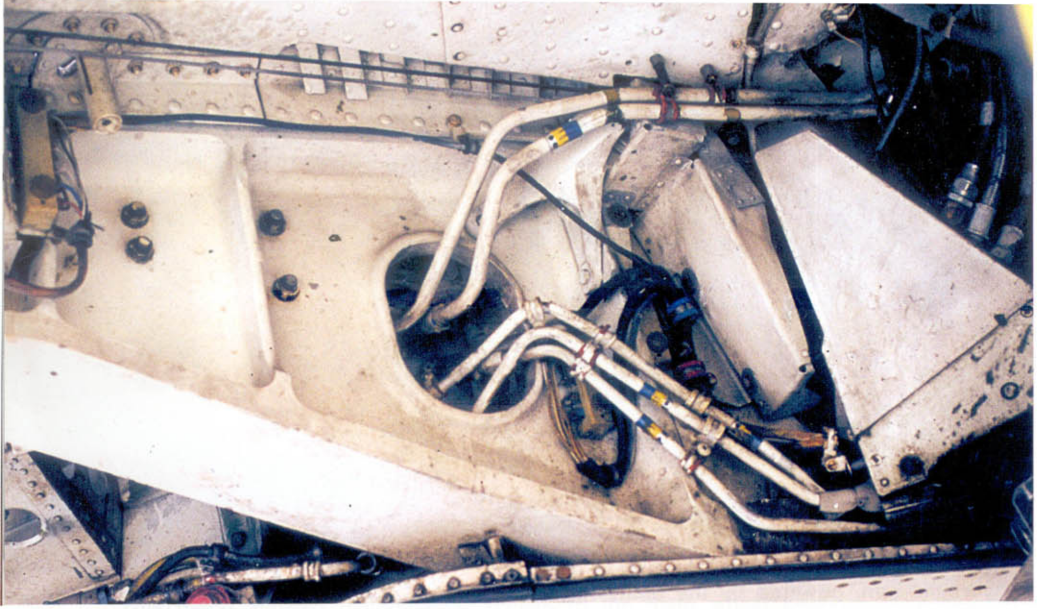
A hydraulic ram, powered by the utility hydraulic system, pulled the retraction strut inward, which in turn pulled the main gear strut into the well. The operation was similar to that of the nose gear. The oleo section of the retraction strut was chromed to allow ease of movement.

Both the retraction arm and the ram were offset within the strut well in order to provide clearance for the main gear strut. Early F-105 wheel and strut wells were natural metal; however, many were painted Chromate Green (FS24151). Camouflaged 'Thuds' serving in Vietnam and Thailand often had the wells painted white or Light Gray (FS36622).



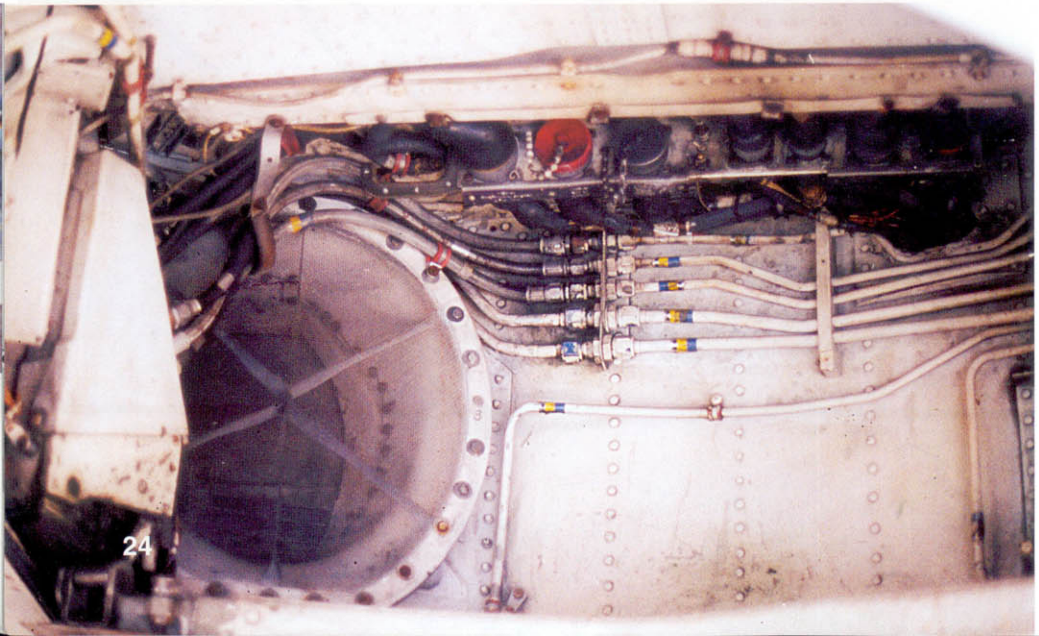
The F-105's main landing gear retraction strut was placed inside the wheel well between two of the aircraft's wing spars. The forward spar formed the front wall of the landing gear wheel well. During the 1960s, stiffening ribs were added to the F-105 main landing gear wells. These ribs increased the aircraft's structural strength and lengthened its service life. (Phillips)

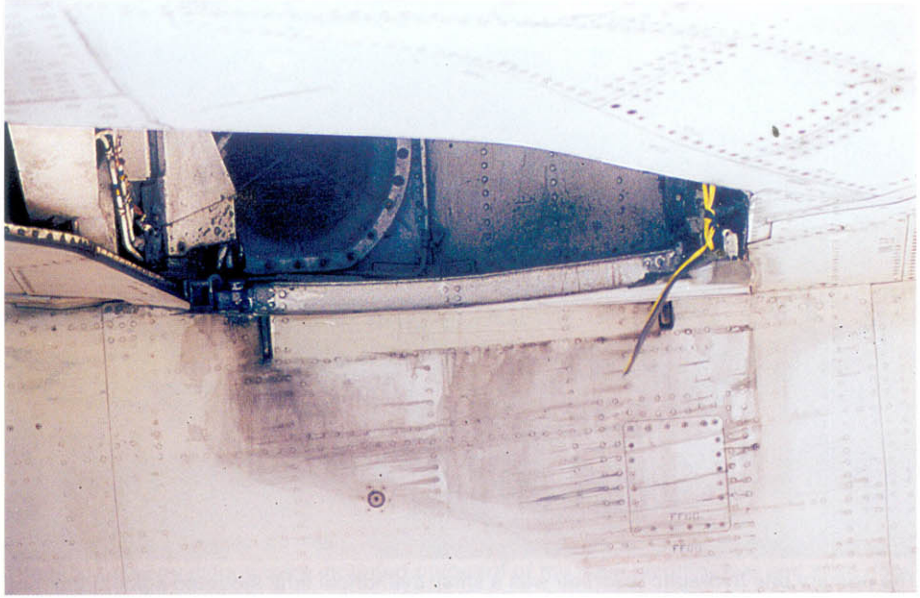




A large forged rib separated the wheel and strut wells. The lightening hole in the rib became a convenient place to pass the hydraulic lines running the length of the wells. Black rubber seals along the wheel well edges sealed the wheel well from air pressure changes and foreign objects when the landing gear doors were closed.

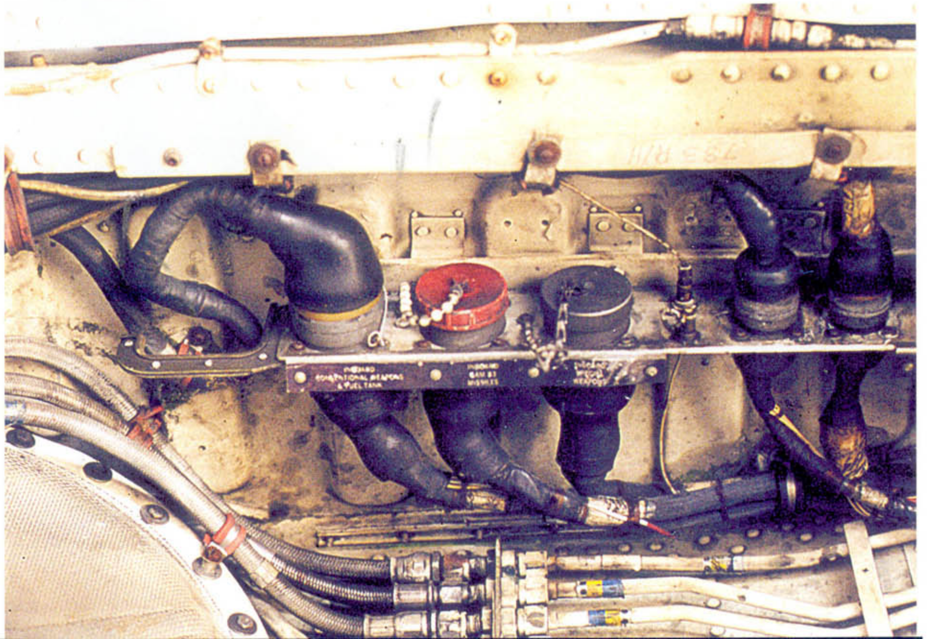
The X-shaped brace inside the circular air intake supports a mesh screen, which keeps foreign objects out of the intake. Next to the secondary air intake duct are a series of hydraulic lines and electrical connectors that are used during ground servicing.

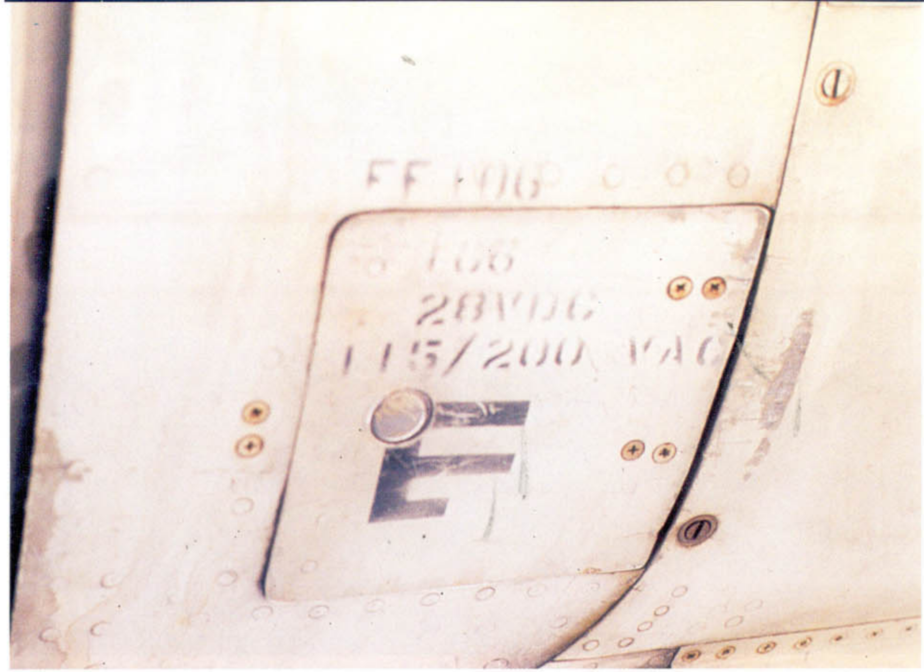




Secondary engine air intakes were buried in both the port and starboard main wheel wells. The intakes fed additional air to the engine when running on the ground. The right inboard wheel well door is missing, however, its outline can be traced in the dirty patch on the fuselage side.

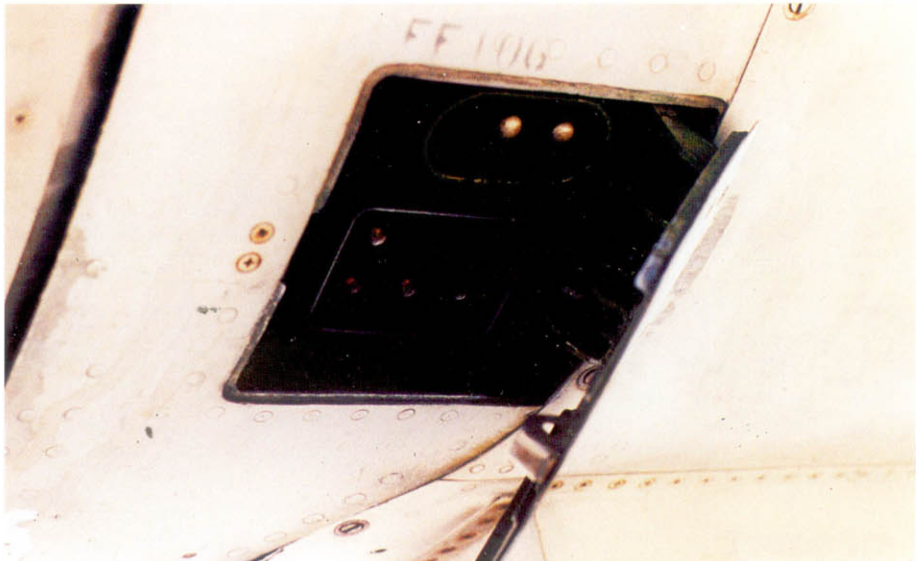
The electrical connectors were used to hook up the tanks and weapons on the inboard and outboard pylons. The connector at left was used for the inboard drop tank. The two capped plugs are for missiles (center) and special weapons (right). The two plugs at far right are for the outboard pylon; a third plug is not visible. Special weapons are a USAF euphemism for nuclear weapons, which the F-105 was designed to carry from the outset.

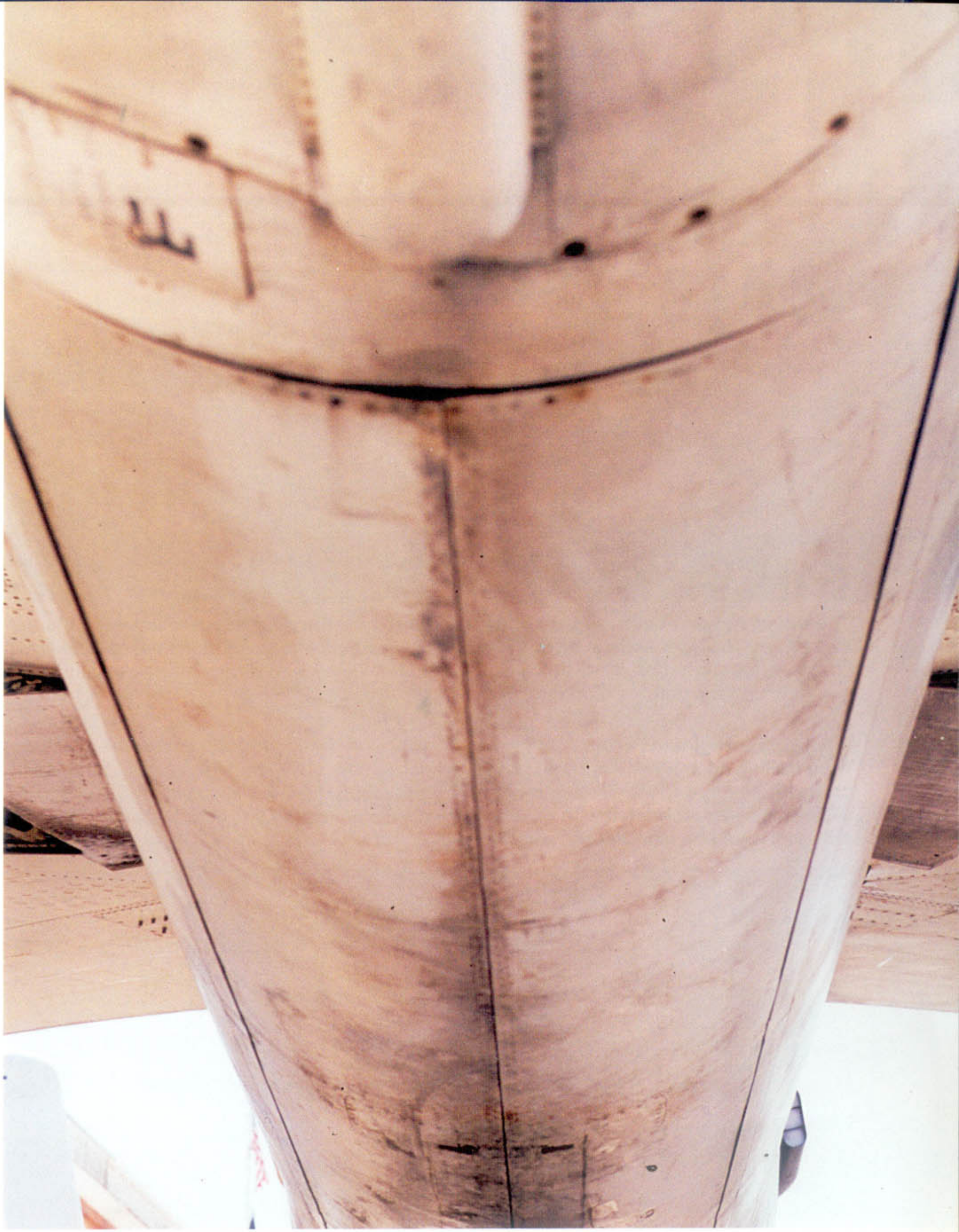




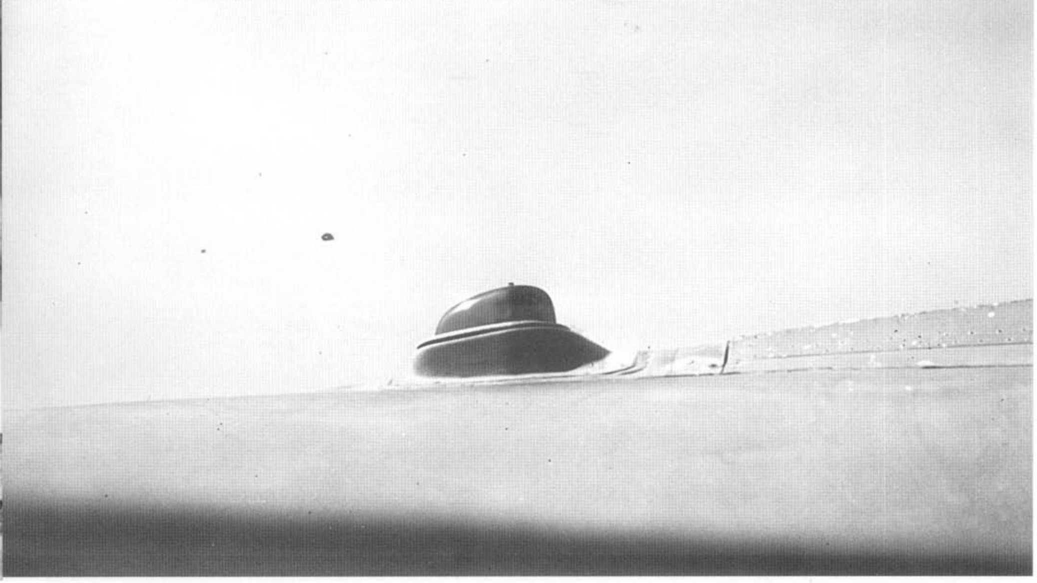
The external power receptacle was fitted to the port lower fuselage immediately ahead of the bomb bay. The panel was opened by depressing the round silver button on the door's aft end. The external electrical connection symbol is painted on the door. The receptacle could take in 28 volts DC (Direct Current) or 115 to 200 volts AC (Alternating Current) of power for ground crew use.

The external power receptacle door opened forward to reveal the receptacle for the ground power unit. Prongs in the sockets fitted into holes in the external power plugs. Forward and to the left of the power receptacle is the aft end of the avionics compartment cooling duct.



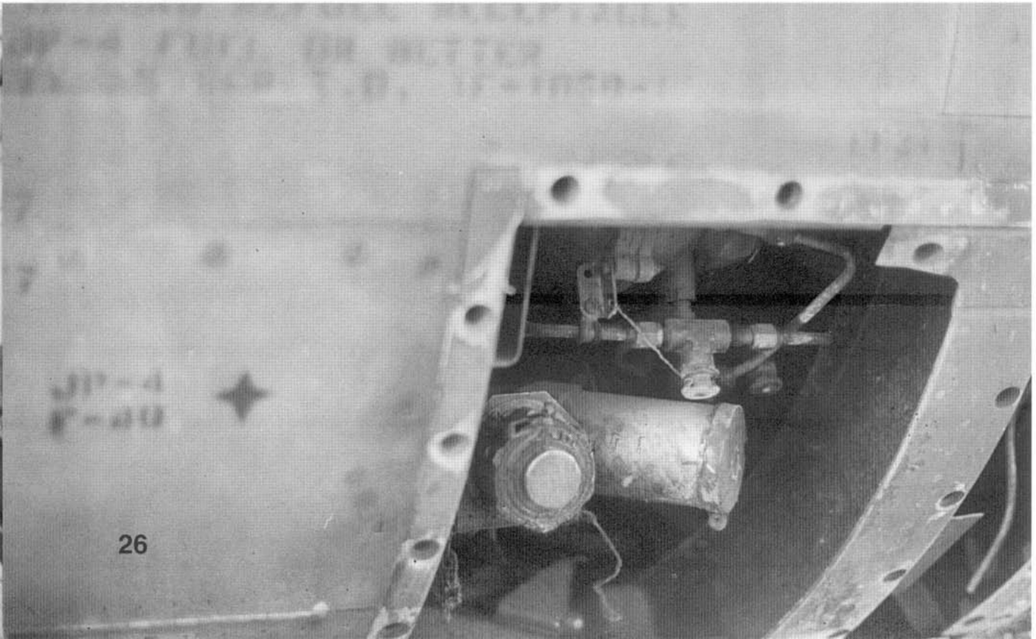


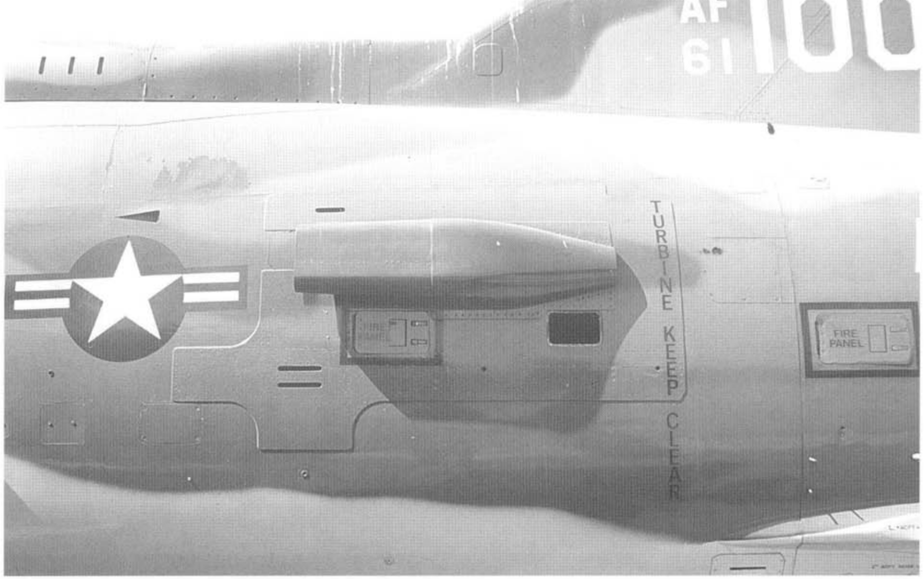
The F-105's mid-fuselage bomb bay was originally designed for internal carriage of nuclear bombs; however, such weapons were rarely carried during the Thunderchief's service. A 390 gallon (1482 L) fuel tank was more commonly placed inside the bomb bay, while external stores – including an additional fuel tank or bombs – could be mounted on the F-105's centerline.



The upper red anti-collision beacon was mounted on the aircraft spine between the tail and wings. The light and its reflector rotated at a speed of 80 revolutions per minute (RPM) to alert other aircraft of the F-105's presence. This light – and its position – remained the same on all Thunderchief variants.

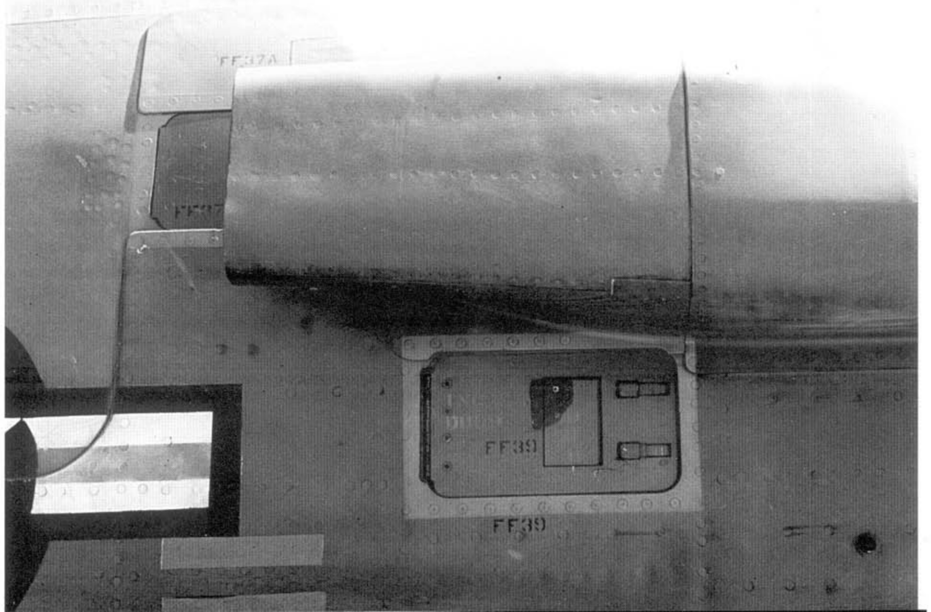
The F-105's engine oil access point is located on the lower fuselage centerline aft of the wing trailing edge and the ground refueling access door. The hatch removed from this aircraft was secured to the Thunderchief by screws along the sides of the hatch. The F-105's J75 engine was lubricated with oil drawn from a 5.5 gallon (20.9 L) tank placed on the port side of the engine compressor section.

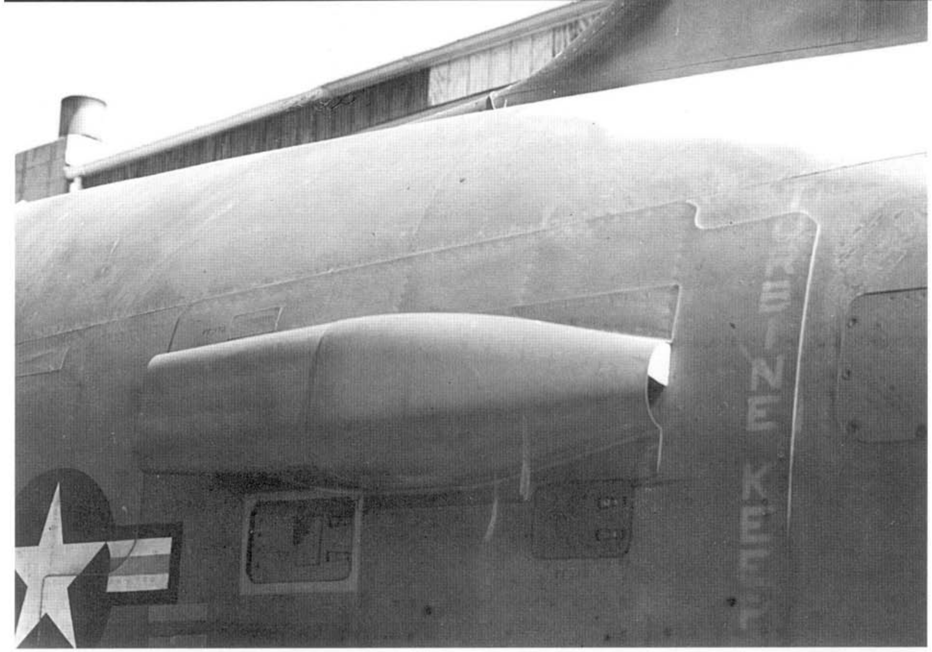




Afterburner cooling scoops were retrofitted to F-105s in 1964 after several Thunderchiefs sustained engine fires. The scoops sent cooling air into the J75 engine's afterburner section, which reduced the risk of fire. An access panel is placed under the cooling scoop, while the engine hydraulic line access panel is placed immediately aft of the scoop. (Phillips)

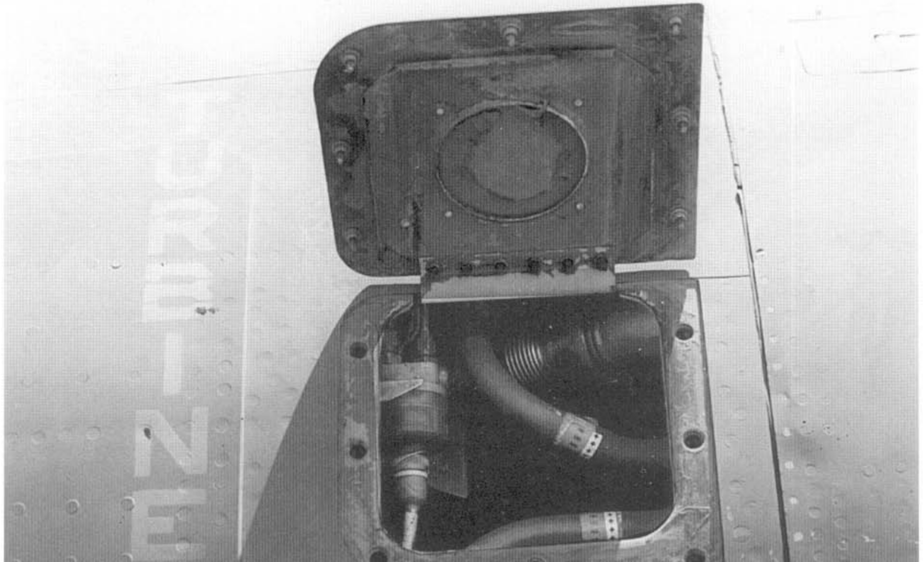
The red-bordered quick access doors in front of and under the aft fuselage engine cooling scoop are engine fire extinguishing systems. The forward opening doors are opened with the two flush-mounted latches at the aft end. Once opened, fire fighting crews could discharge foam into the engine compartment to put out the fire.

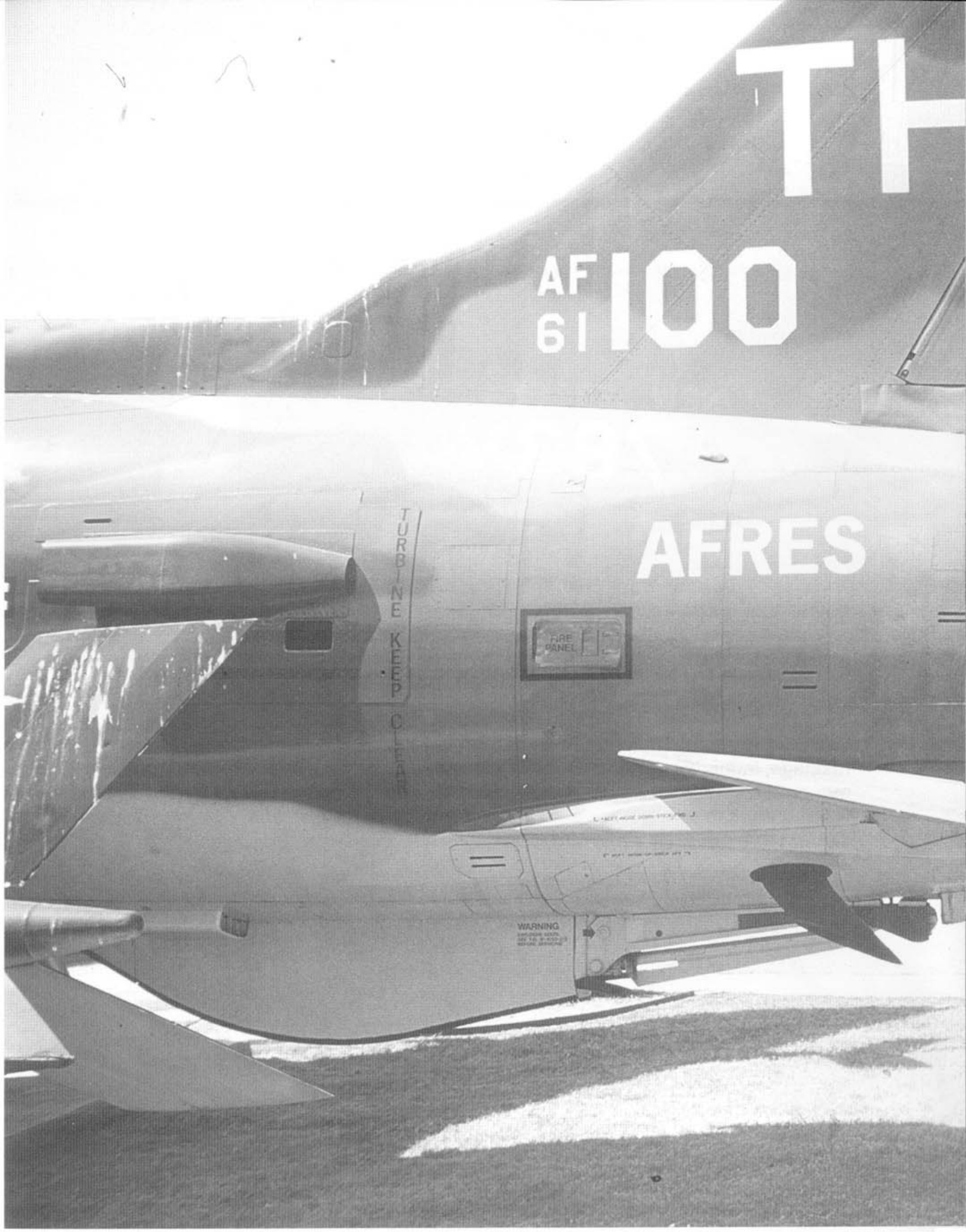




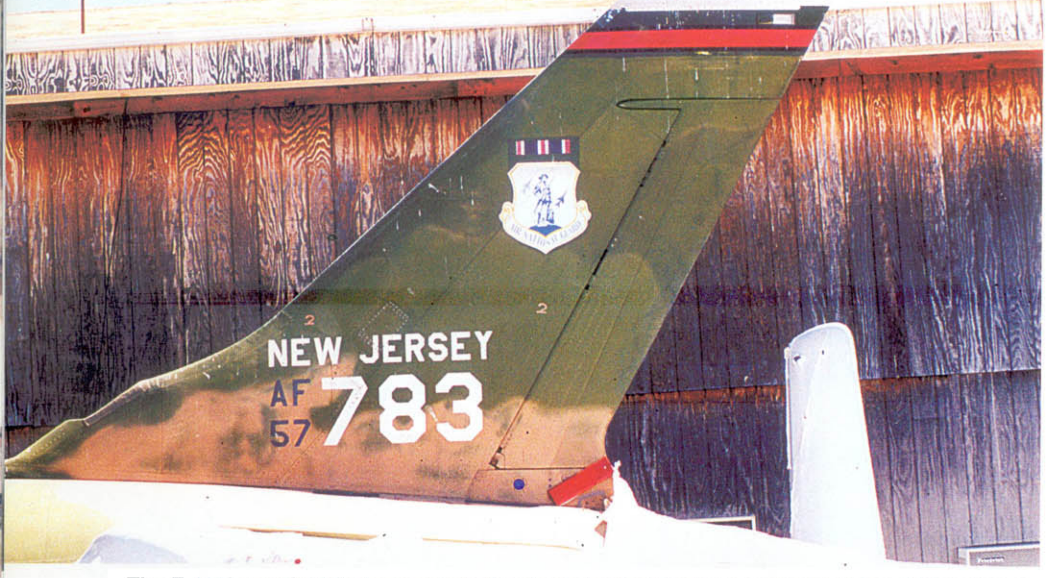
Afterburner cooling scoops were mounted on both sides of the F-105's aft fuselage. The scoops were retrofitted to all remaining Thunderchiefs in 1964, after a series of in-flight fires occurred in the afterburner sections of several F-105s. The red lettering behind the scoop is the beginning of the phrase TURBINE KEEP AWAY, a warning for maintenance crews of the engine's turbine section.

The open access panel behind the engine scoop provided access to hydraulic lines in the engine area. These lines fed hydraulic fluid to the rudder, stabilators, and the combination exhaust nozzle control and speed brakes surrounding the engine exhaust. The door attachment screws remained with the door and were tightened when the door was closed by maintenance personnel.



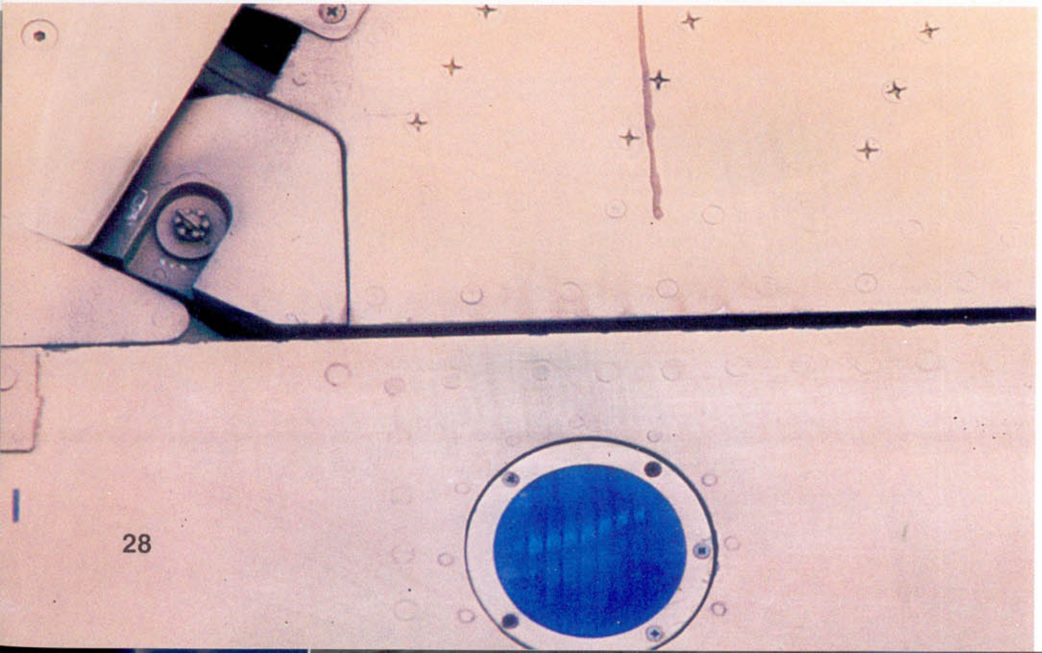


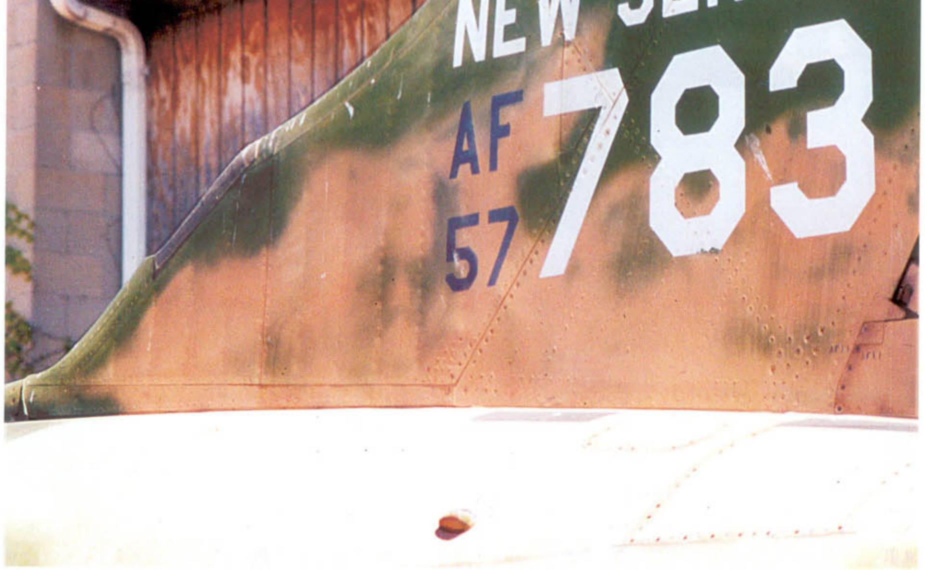
Afterburner scoops were fitted to this F-105D on display at the Carswell Joint Reserve Base (JRB) Museum in Fort Worth, Texas. The stabilators are angled slightly upward. The underside fin contains the arresting hook used for emergency landing. The fuel dump is placed on the fuselage beside the aft end of the hook. (Phillips)



The F-105's vertical fin incorporated a single hydraulically powered rudder. A blue formation light was mounted at the base of the fin, while a white position light was mounted at the top, just below the fiberglass fin tip. This F-105B tail section is from aircraft 57-5783, which has the Outstanding Unit Award ribbon above the Air National Guard (ANG) insignia.

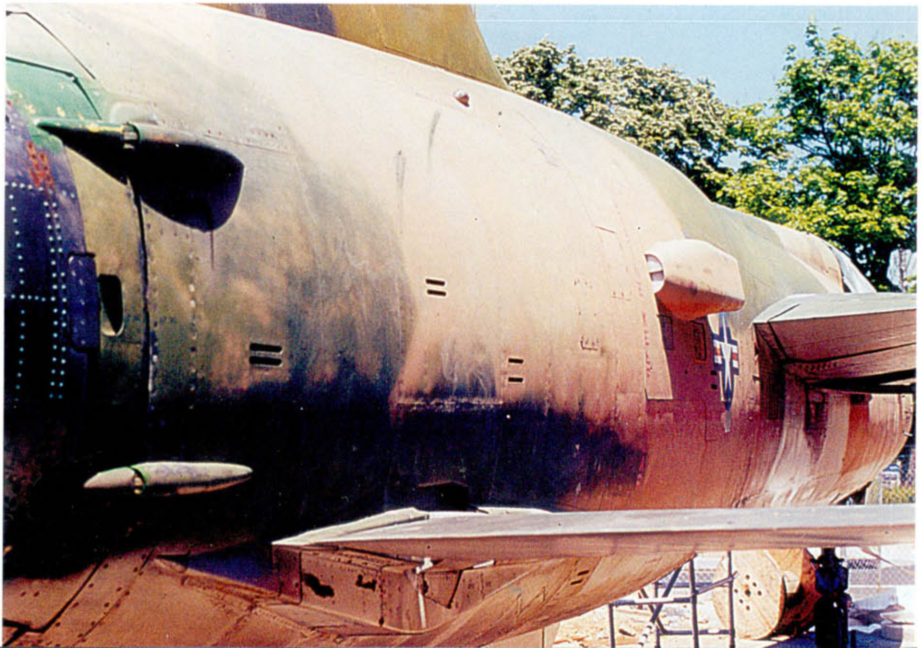
The blue formation light was located at the base of the tail on both sides of the F-105's fuselage, immediately below the lower edge of the rudder. A second pair of blue lights was mounted on the forward fuselage sides below the cockpit. The rudder was hinged at its leading edge to turn port or starboard according to inputs from the pilot's rudder pedals. Two other hinges were placed further up on the rudder leading edge.

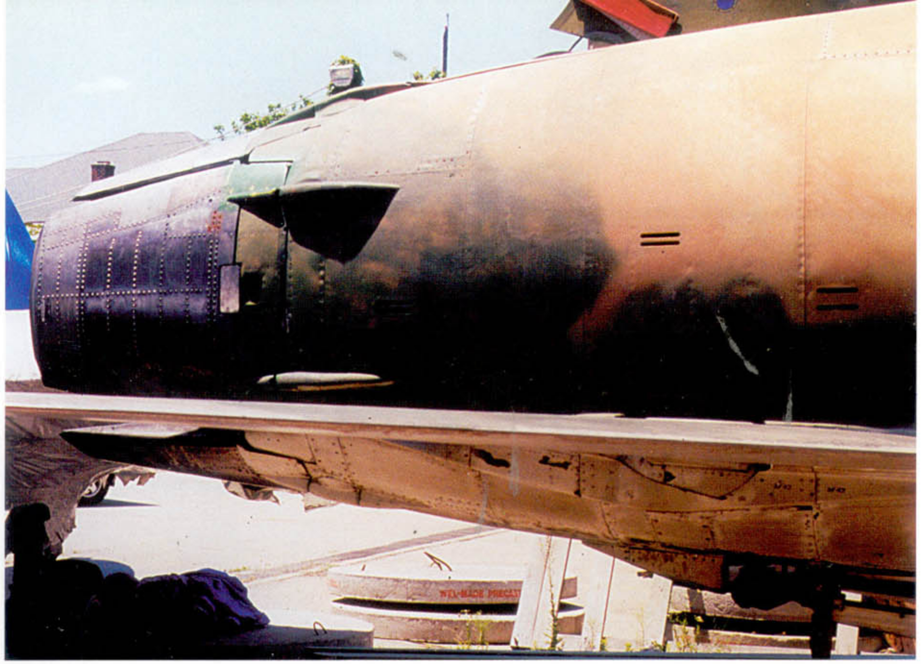




The lower leading edge of the F-105's tail contained a kink, which housed an intake ducting cooling air into the aft fuselage and engine afterburner section. Additional scoops were located on the aft fuselage sides. A white light is housed within the small blister on the aft fuselage surface. The lower half of the blister is painted to throw light up onto the vertical fin.

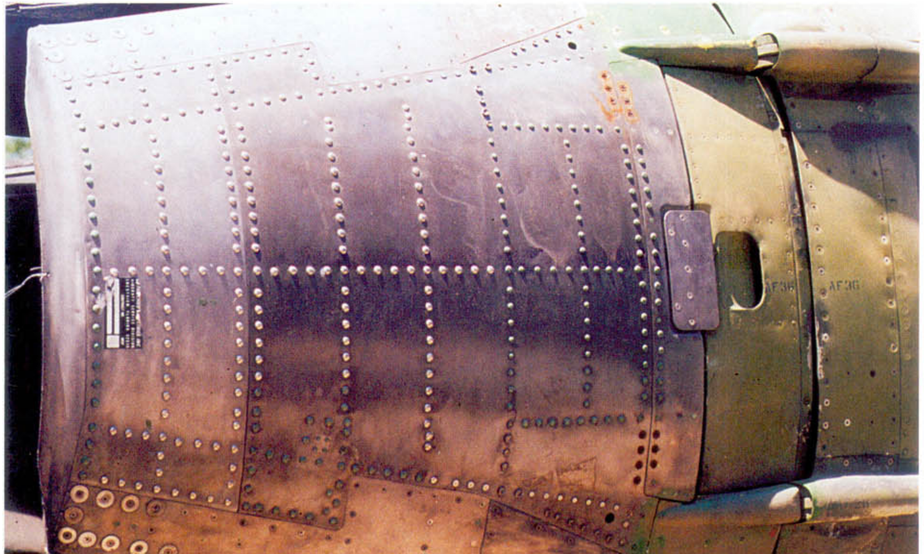
The F-105's stabilator – a combination of horizontal stabilizer and elevator – is set low in relation to the wing. The sets of twin parallel slits placed above and below the stabilator are afterburner section cooling vents, which allowed heated air to escape from the fuselage. A formation light is mounted on the small aft fuselage blister below the base of the vertical stabilizer.

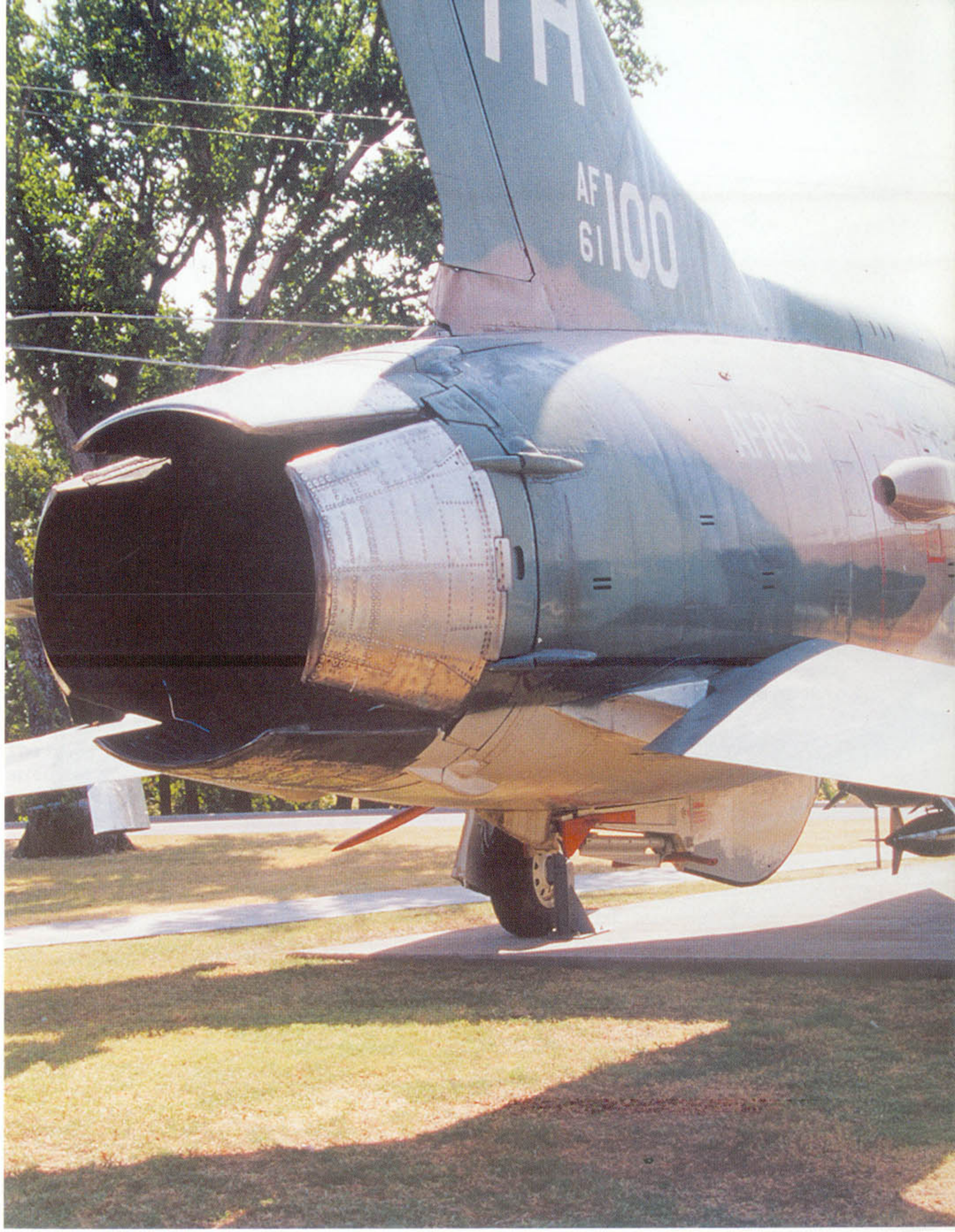




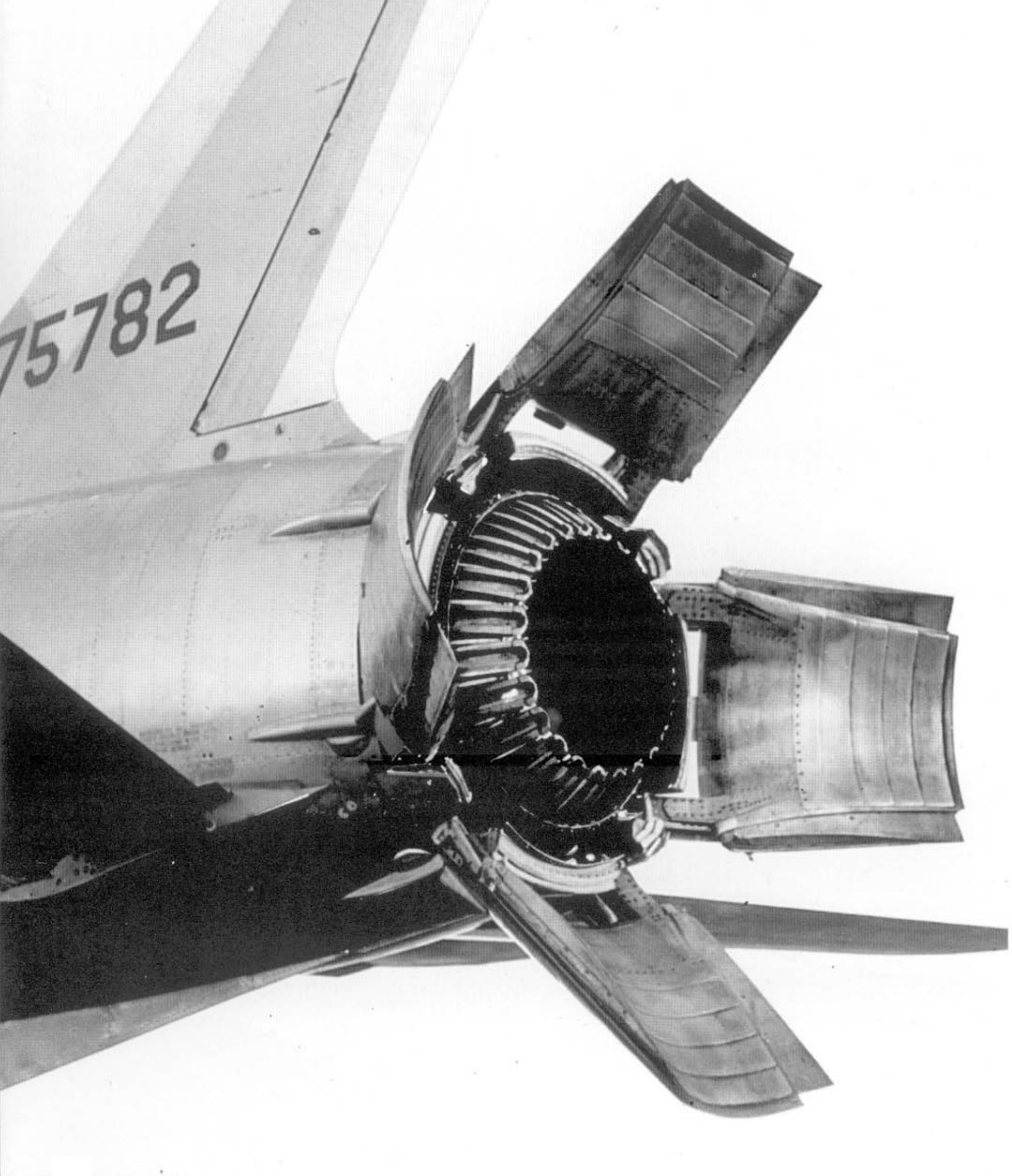
The lower speed brake on this displayed F-105B is fully retracted; normally, the lower speed brake was lowered when the aircraft was on the ground and hydraulic pressure had bled from the speed brake system. A red rudder lock was installed to prevent the rudder from swinging to either side in strong winds while the aircraft was parked.

The F-105's four speed brake petals and the rivets used to fasten the panels were built from stainless steel. This material was needed to minimize corrosion due to the high heat of the engine exhaust gases, which could reach a maximum temperature of 1247° Fahrenheit (660° Celsius). Each speed brake petal was controlled by two hydraulic actuators mounted ahead of the petal.

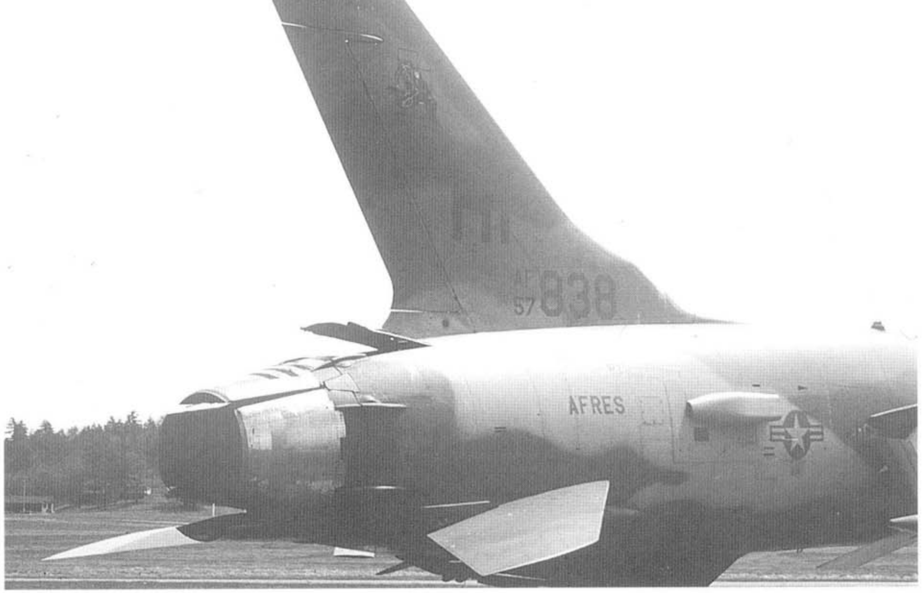




The aft fuselage of the F-105D and later models was unchanged from the earlier F-105B. The speed brakes have slightly opened on this Thunderchief displayed at the Carswell Joint Reserve Base (JRB) Museum in Fort Worth, Texas. Fairings containing the speed brake hydraulic actuators are placed ahead of the brakes themselves. The arresting hook is mounted on the rear fuselage undersurface ahead of the engine exhaust. (Phillips)

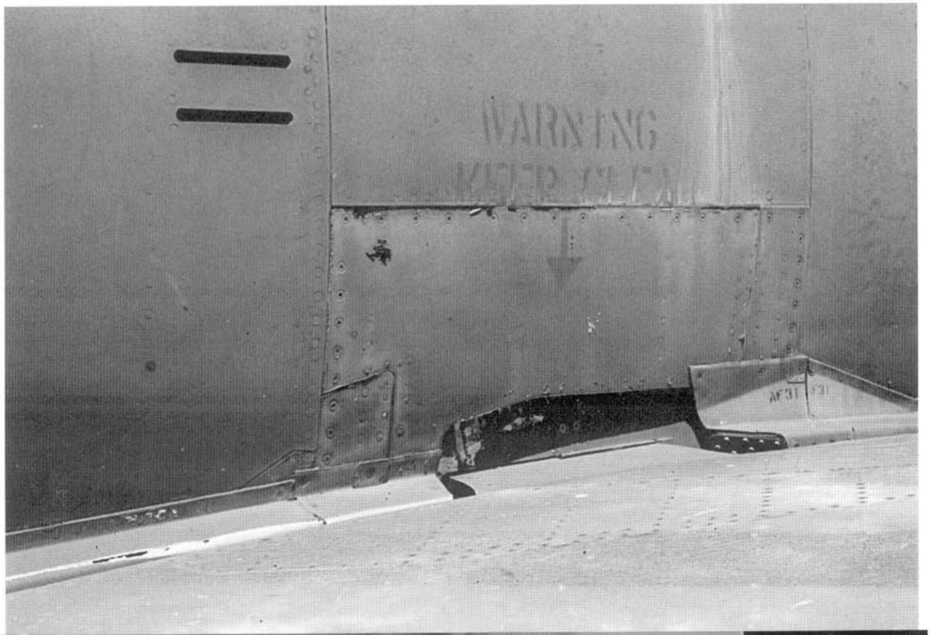


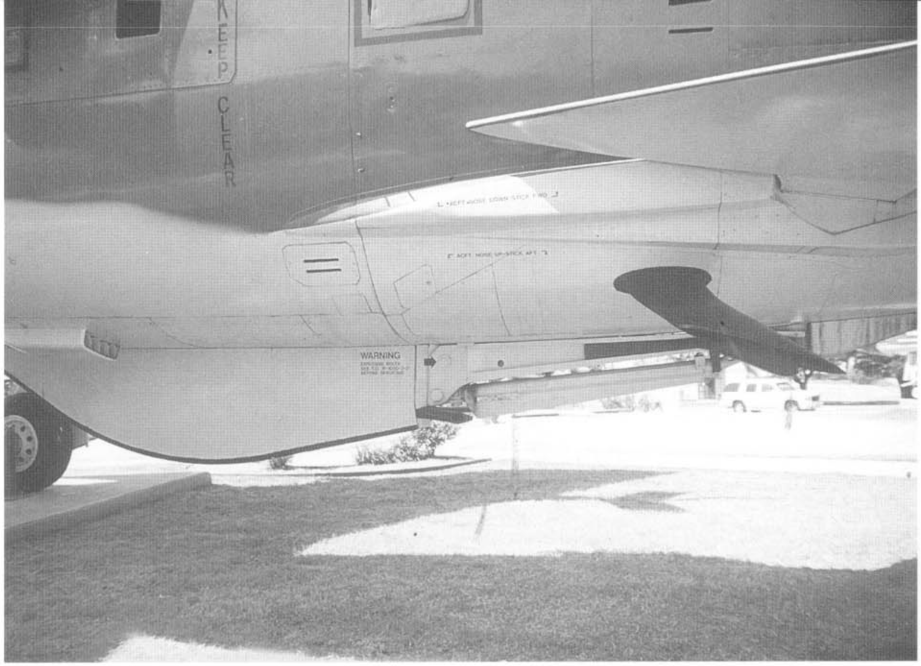
The F-105 employed a set of four petals hinged at the exhaust nozzle located at the rear of the fuselage. These petals were speed brakes used for both landing and during dive bombing. The speed brakes also doubled as the engine exhaust nozzle control. The side petals were the only ones extended for landing, since the bottom petal could hit the ground and the top petal was in the way of the drag chute door. (Cradle of Aviation Museum)



The braking parachute door is opened behind the vertical stabilizer of the F-105B (57-5838) displayed at Volk Field, Wisconsin. The standard braking parachute canopy was 20 feet (6 M) in diameter and was deployed when the F-105 slowed to 200 knots (229.8 MPH/370 KMH) airspeed on the runway. (Curtiss Knowles)

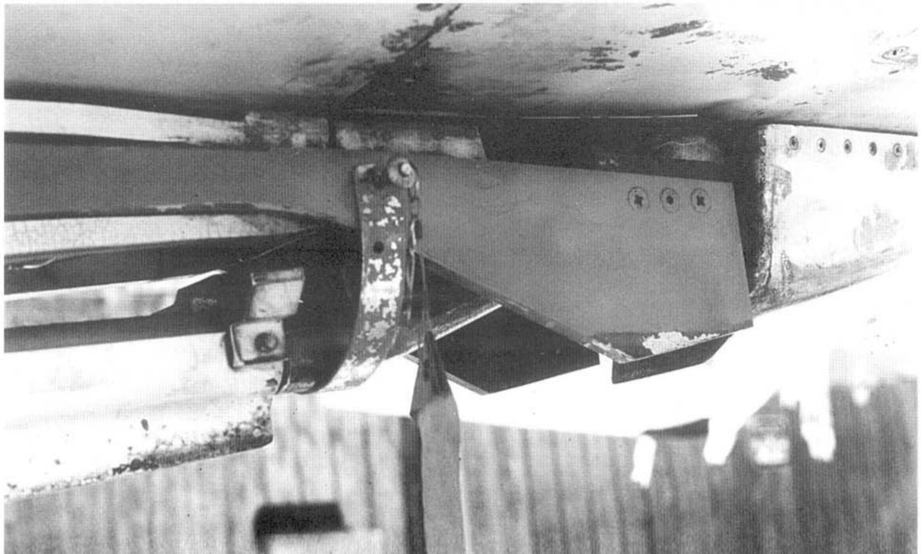
The stabilator (combination horizontal stabilizer and elevator) was mounted to the aft fuselage at a single pivot point. The black phrase WARNING KEEP CLEAR above the pivot point was directed to maintenance crewmen working on the stabilator. The pairs of parallel slots above the stabilator are engine afterburner compartment cooling vents.

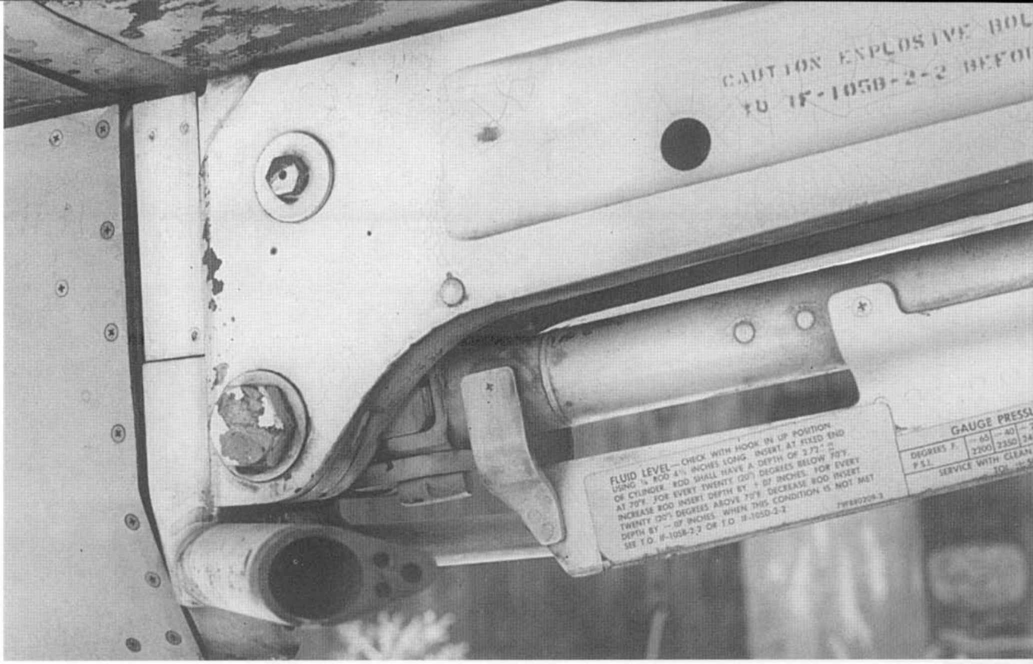




The F-105's arresting hook is located in the aft portion of the ventral fin. The fin aided in maintaining the Thunderchief's lateral stability. The spade hook grabbed arresting cables placed at the airfield in the event the aircraft sustained brake failure on landing. The arresting hook was extended through an explosive bolt fired from the cockpit and was manually retracted on the ground. The fuel dump vent is placed beside the hook's aft end.

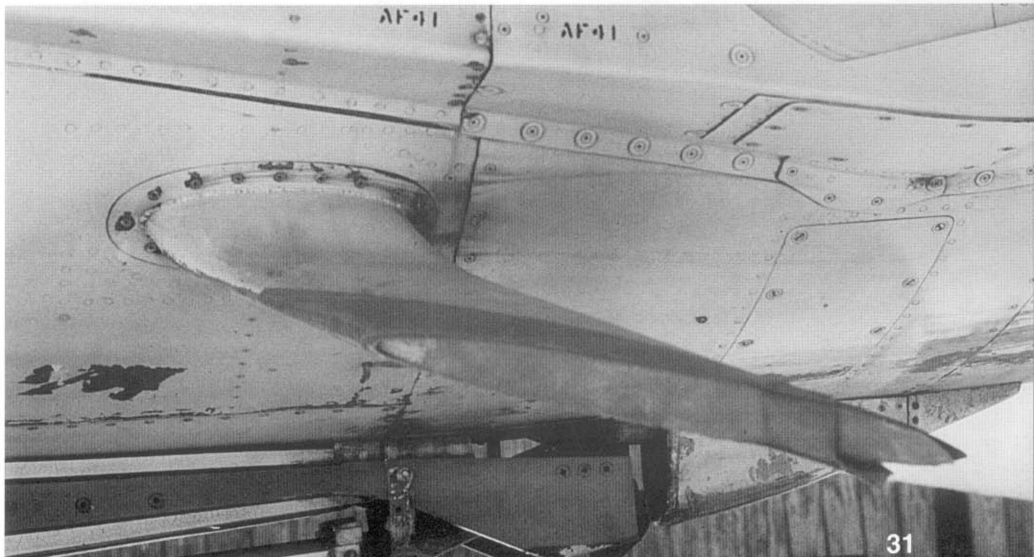
A red protective guard covers the aft portion of the arresting hook assembly while the aircraft is on the ground. This bracket prevents the hook linkage from damage during aircraft servicing and is removed prior to flight. The protective bracket is mounted on beams flanking the hook.

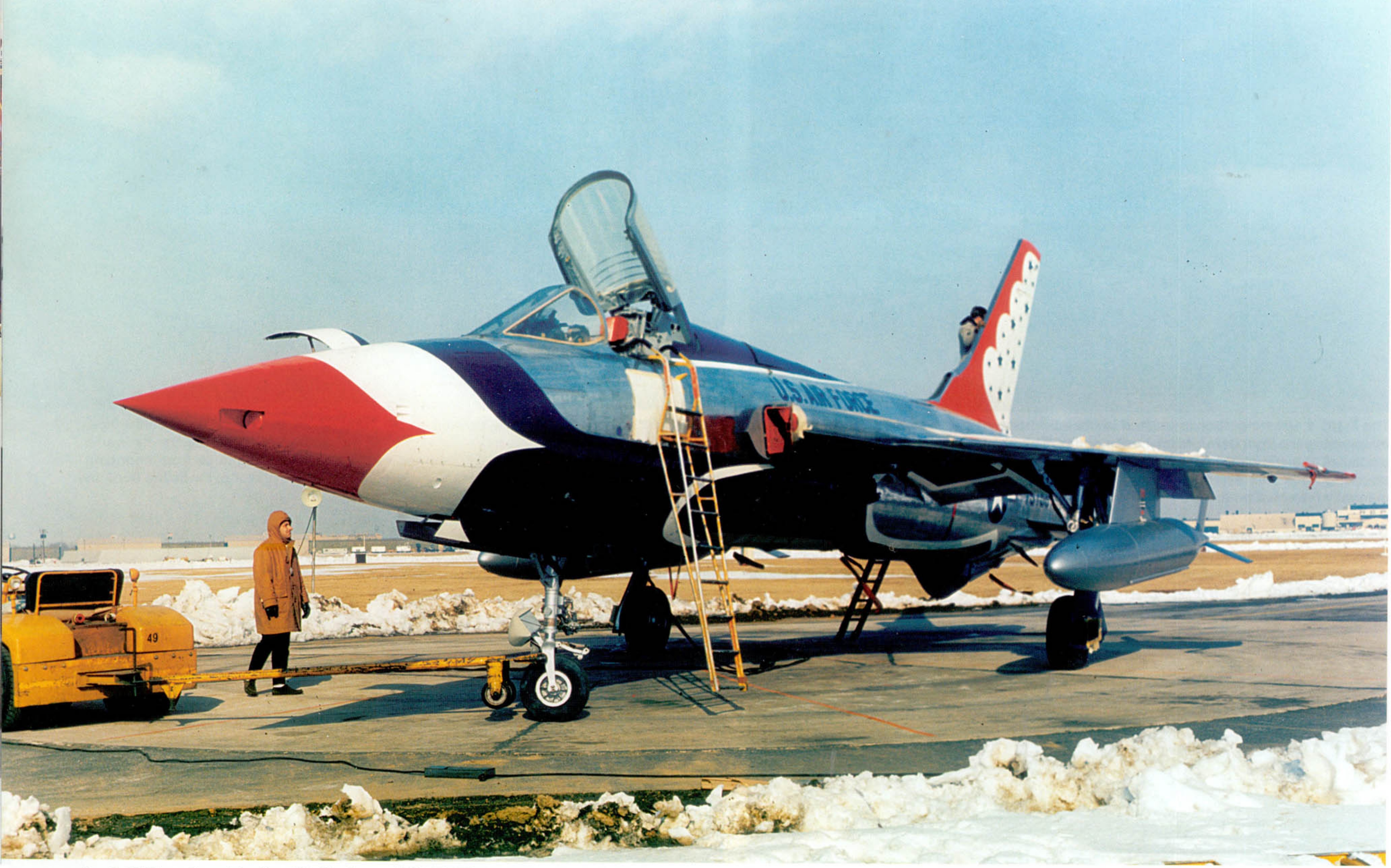




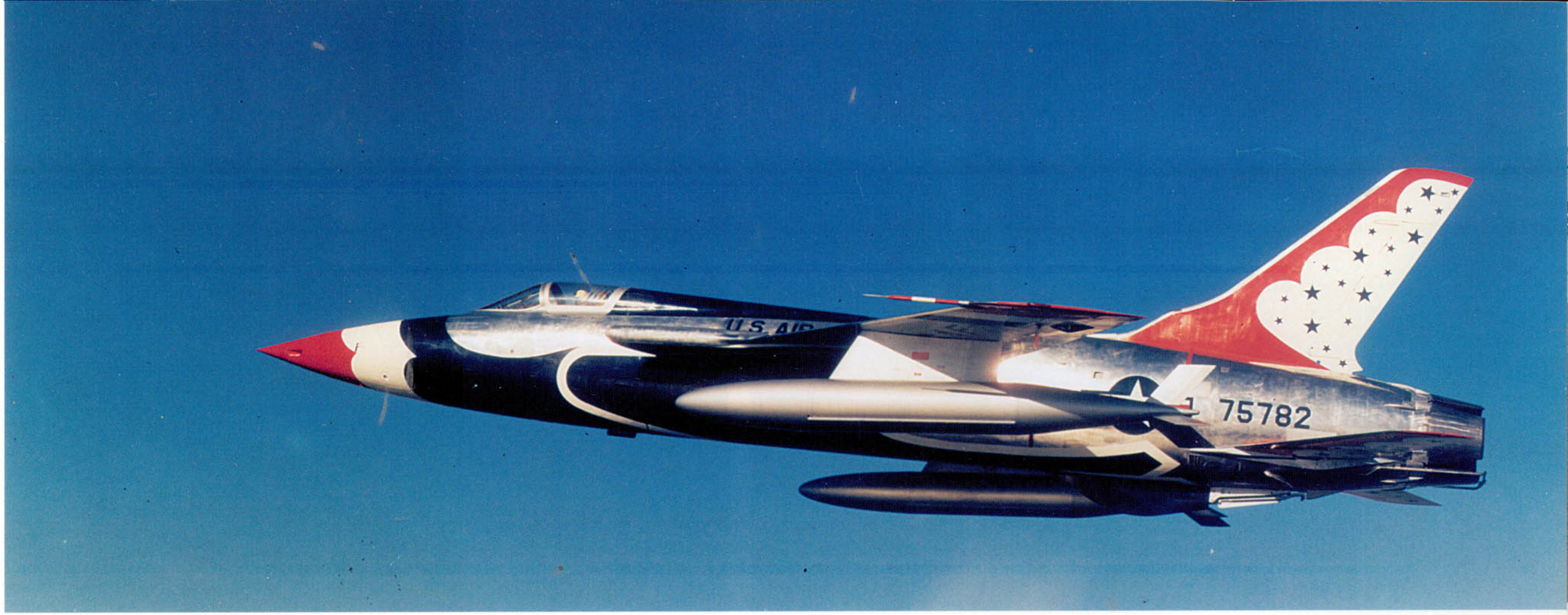
The F-105B's arresting hook is pivoted at the front along the aircraft's undersurface. Maintenance instructions placed on the hook mechanism are for checking the hydraulic fluid level in the hook's damper. The damper prevents the arresting hook from bouncing up and down when the hook contacts the runway. An explosive bolt extends the hook to snare cables stretched across the runway-overrun area of an airfield.

The F-105's fuel dump is mounted on the aft fuselage undersurface, immediately left of the arresting hook's aft section. Fuel is vented from the aircraft through this dump to lighten the aircraft for emergency landings. A red cover is placed over the fuel dump's opening during ground maintenance to prevent foreign objects from entering and damaging the vent.



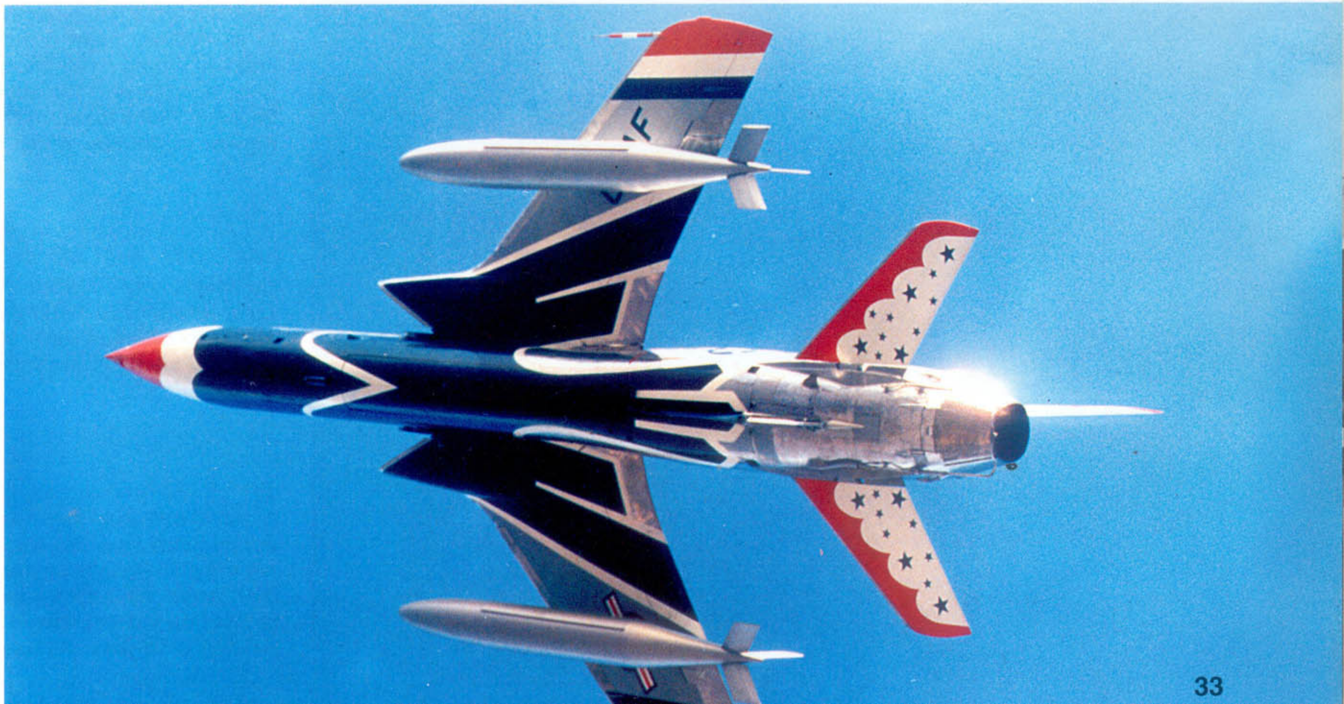


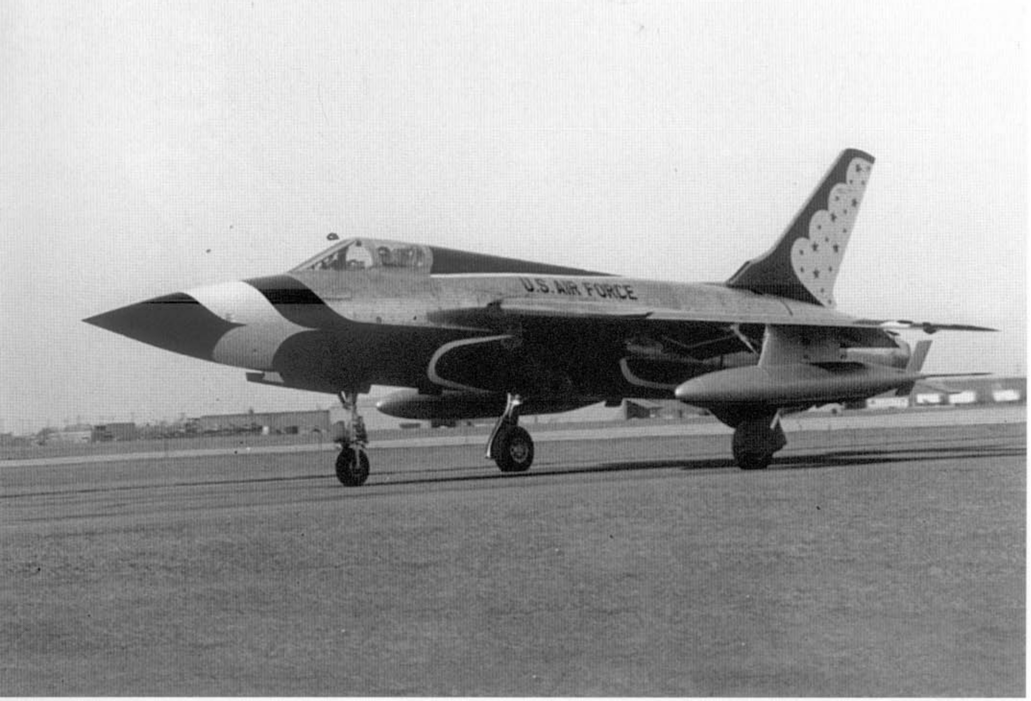
An F-105B assigned to the US Air Force (USAF) Flight Demonstration Squadron, the Thunderbirds, is prepared for a test flight from Fairchild Republic's Farmingdale, New York facility in February of 1964. This Thunderchief features the later and more pronounced Thunderbirds scallop design on the nose. The USAF modified nine F-105Bs for the Thunderbirds by removing the armament and adding smoke oil dispensers. The Thunderbirds flew only six shows in 1964 when one of their F-105Bs broke apart during flight and crashed at Hamilton AFB, California on 9 May 1964, killing the pilot, Capt Gene Devlin. Investigators determined that the structural splice plate on top of the fuselage had failed. This resulted in Thunderchiefs being redesigned under Project BACKBONE to prevent a recurrence of this incident. The Thunderbirds reverted to North American F-100 Super Sabres for the remainder of the 1964 show season. (Cradle of Aviation Museum)

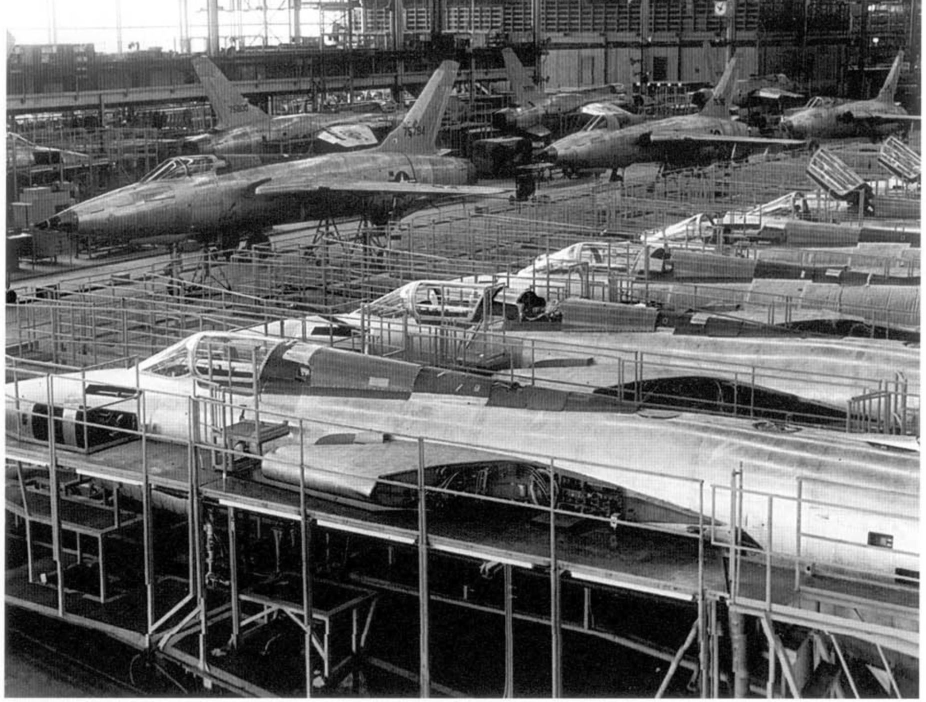


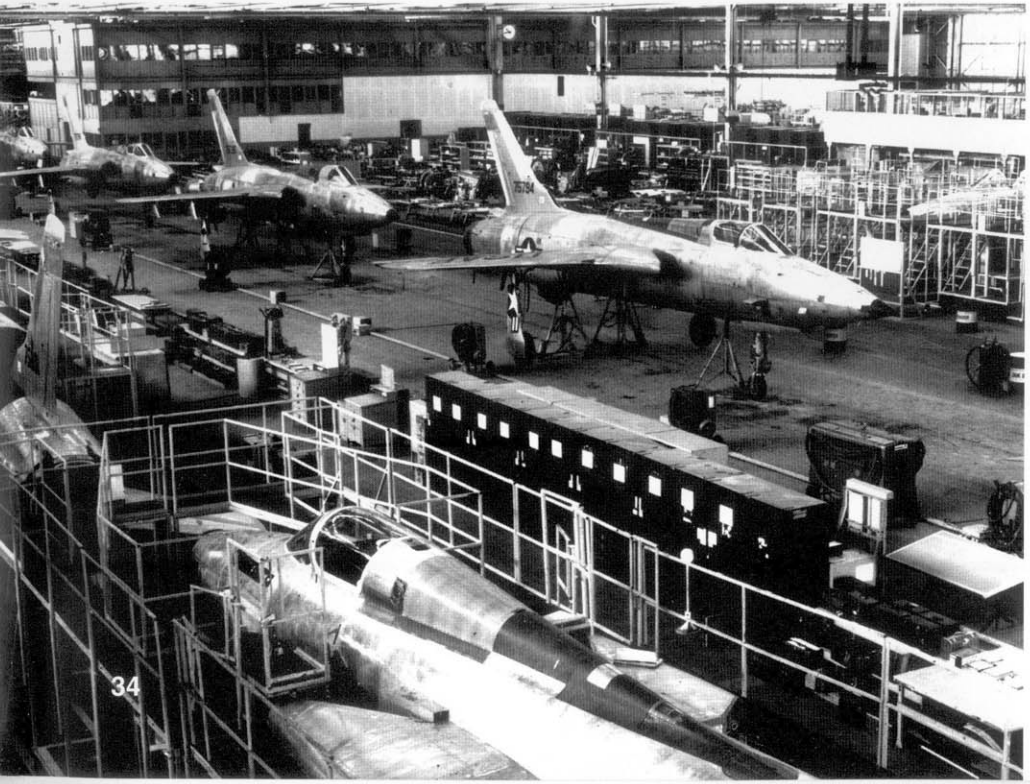
(Above) The first Thunderbirds F-105B (57-5782) flies on a training mission from Nellis AFB, Nevada – the Thunderbirds' home base – on 25 January 1964. This aircraft is equipped with 450 gallon (1701 L) wing fuel tanks, which were not carried on flight displays, and is painted in the original nose scallop pattern for the Thunderbirds' F-105Bs. Pipes mounted under the exhaust nozzle control petals discharged smoke oil, which was heated by the engine exhaust to produce colored smoke during flight displays. After the fatal crash on 9 May 1964, the Thunderbirds reverted to North American F-100 Super Sabres for the remainder of the year's performances. The eight remaining Thunderbird F-105Bs were returned to operational status and transferred to the 141st Tactical Fighter Squadron, New Jersey Air National Guard at McGuire AFB. (Cradle of Aviation Museum)

(Right) The distinctive Thunderbird marking was applied to the fuselage and wing undersurfaces of the Squadron's F-105Bs. The 450 gallon wing tanks obscure the US national insignia carried under the starboard wing and the letters USAF under the port wing. The smoke oil pipe arrangement allows the speed brake petals to be used without interference from the two oil pipes. Thunderbird F-105Bs were highly polished aircraft, as befitting machines flown by flight demonstration teams. (Cradle of Aviation Museum)





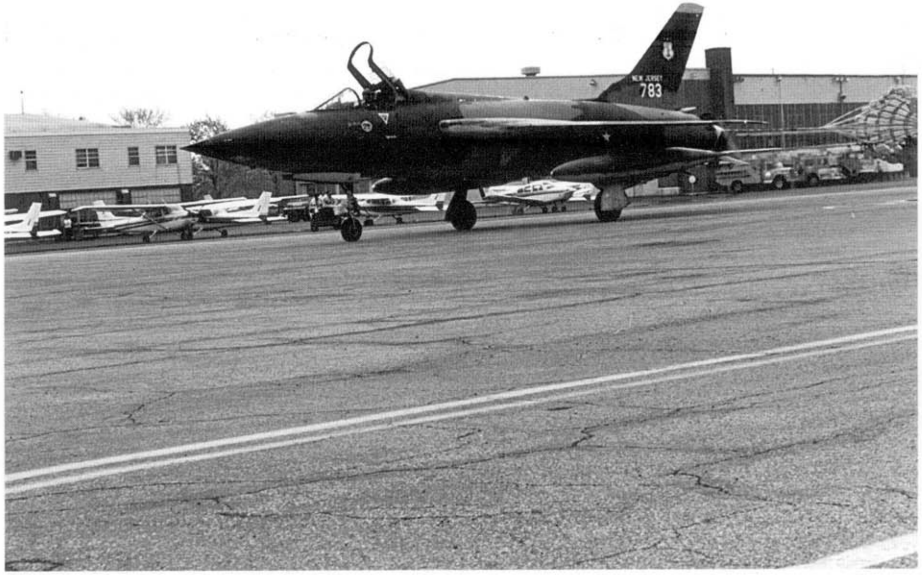




(Above Left) A Thunderbirds F-105B (57-5801) taxies to the runway at Farmingdale prior to its delivery flight to the US Air Force in March of 1964. This ill-fated Thunderchief crashed during an air show at Hamilton AFB, California two months later, killing the pilot, Capt Gene Devlin. The accident prompted the Thunderbirds to withdraw the F-105B from the team. Plans to return to the F-105 after the 1964 show season were ended by the growing war in Vietnam, which had priority on Thunderchiefs. (Cradle of Aviation Museum)

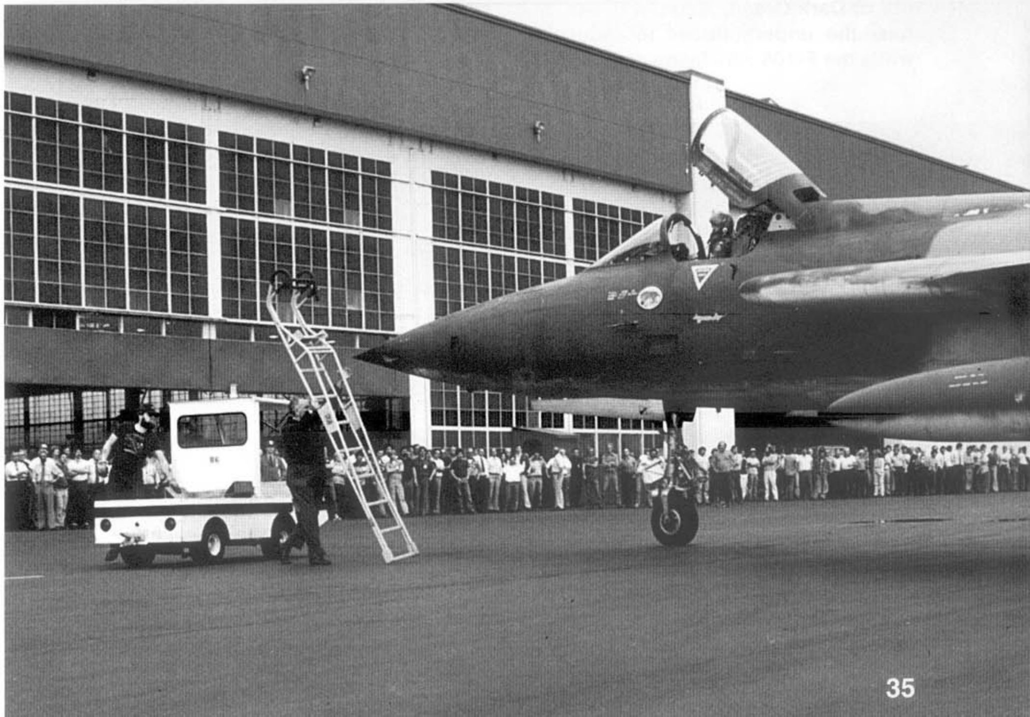
(Above) Nearly-complete F-105Bs go through final assembly at Republic's Farmingdale, Long Island (New York) plant in January of 1959. Approximately 25 percent of the total F-105B production run – 18 of 71 aircraft built – were completed during this month. Six fuselage sections await fitting out prior to mating with the wings. (Cradle of Aviation Museum)

(Left) F-105Bs in the final production stages roll through the center of Republic's Farmingdale assembly line. The fuselages to the right of the final assembly line are awaiting wing sections to be joined before taking their places in the final assembly stage. Basic markings – national insignia, USAF on the wings, and serial number on the tail – were painted on the Thunderchiefs during final assembly. Aft fuselage anti-glare panels were painted Olive Drab (FS34087). (Cradle of Aviation Museum)

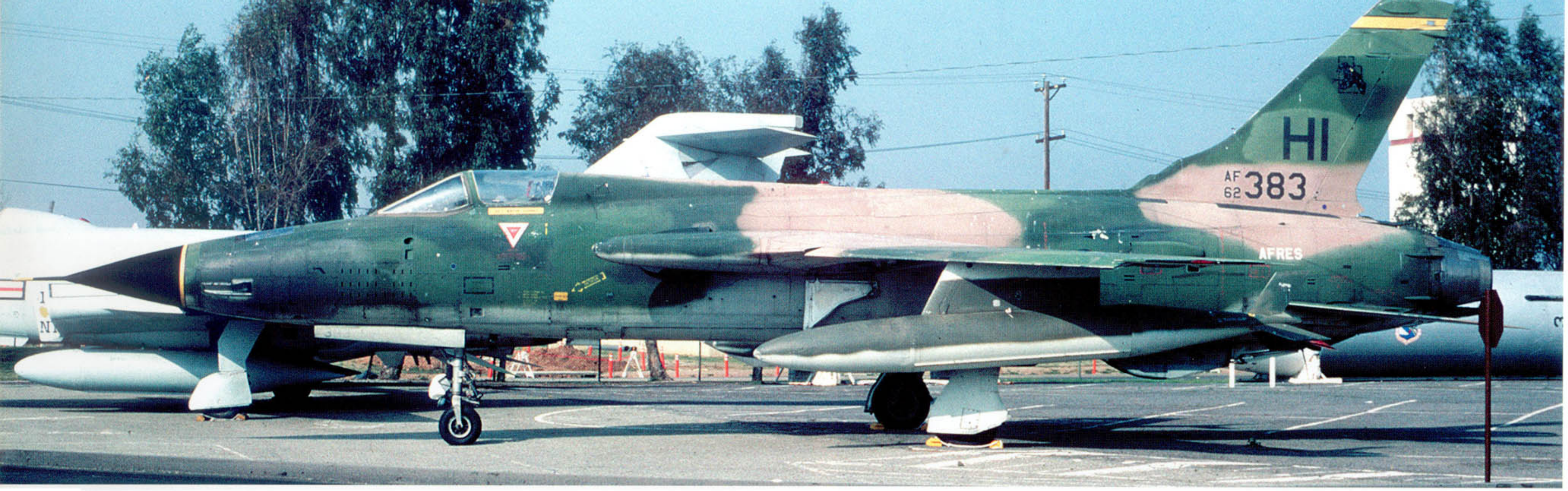


(Above) An F-105B (57-5783) taxis after landing at Republic Airport in Farmingdale, New York on 29 April 1981. The aircraft's drag chute, used to reduce the aircraft's landing roll, is streamed from the Thunderchief's tail. This F-105B was deactivated from service with the New Jersey Air National Guard (ANG) after landing at Republic Airport. The Thunderchief was then delivered to the Cradle of Aviation Museum at nearby Michel Field for permanent display. (Cradle of Aviation Museum)

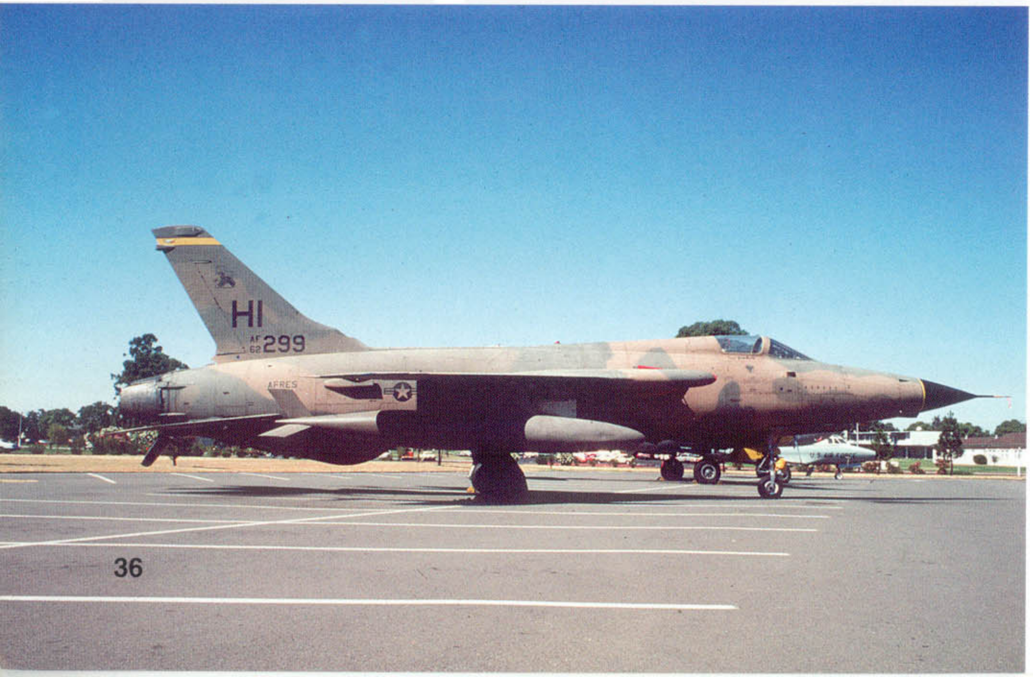
(Above Right) An F-105B Thunderchief (57-5783) assigned to the New Jersey ANG receives taxi instructions from a ground crewman after arriving at Republic Airport in Farmingdale, New York on 29 April 1981. The aircraft had been based at McGuire Air Force Base, New Jersey during its service with the New Jersey ANG. The canopy was opened to allow the pilot to take in fresh air. The F-105's canopy was usually left open during taxiing. (Cradle of Aviation Museum)



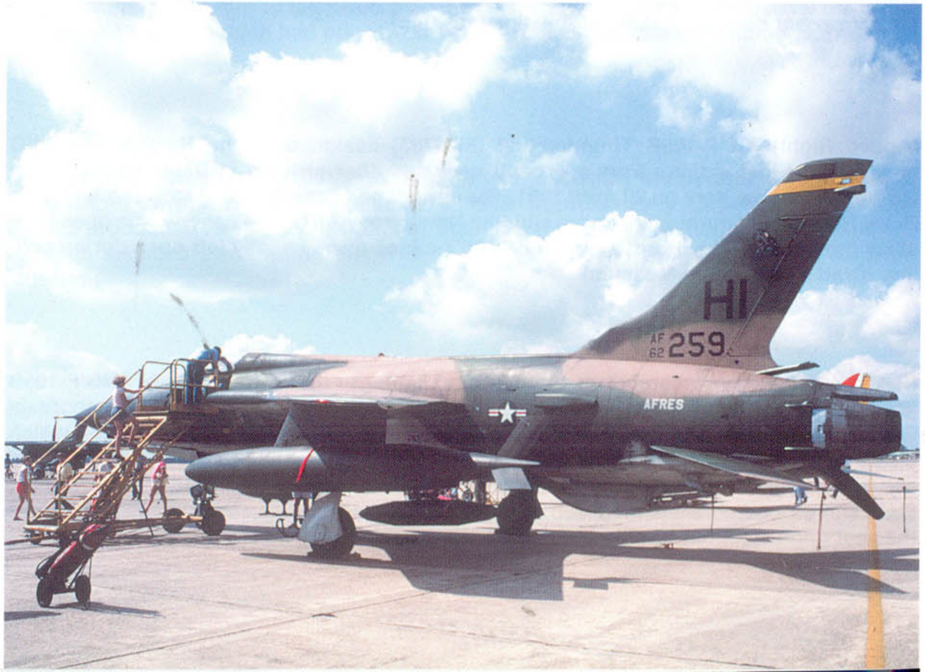
(Right) A ground crewman brings the boarding ladder to the ex-New Jersey ANG F-105B (57-5783) after the aircraft has parked in front of the Fairchild Republic hangar in Farmingdale. The top of the access ladder would be hooked onto the canopy sill, which would allow the pilot to leave the aircraft. Immediately beneath the canopy sill is the red and white ejection seat warning triangle. This internationally recognized triangle alerted flight and ground crews of the explosive materials used to jettison the canopy and launch the seat upon ejection. (Cradle of Aviation Museum)



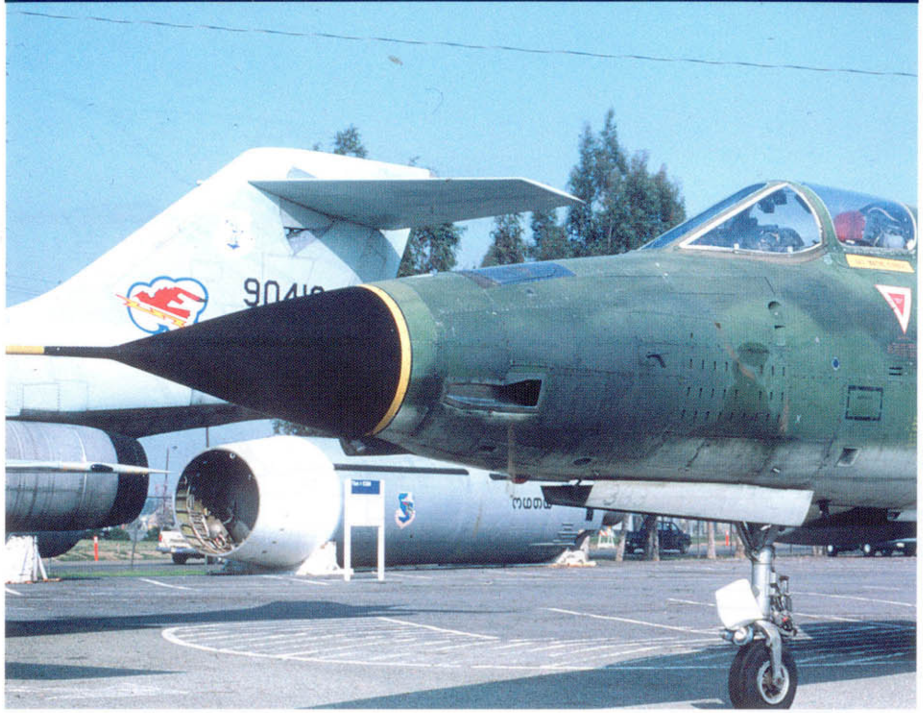
(Above) A Republic F-105D Thunderchief (62-4383) is displayed at the March AFB Museum in California in March of 1987. The aircraft was assigned to the 466th TFS, 419th Tactical Fighter Wing (TFW), an Air Force Reserve unit, stationed at Hill AFB, Utah. The Thunderchief displays the 466th TFS insignia on the tail. (Curtiss Knowles)



(Below) This 466th Tactical Fighter Squadron (TFS) F-105D (62-4299) was finished in a wrap-around version of the Southeast Asia camouflage scheme. The uppersurface colors of Dark Green, Medium Green, and Tan were extended over the undersurfaces to reduce the aircraft's visibility while the F-105 was flying at low altitude. (Curtiss Knowles)

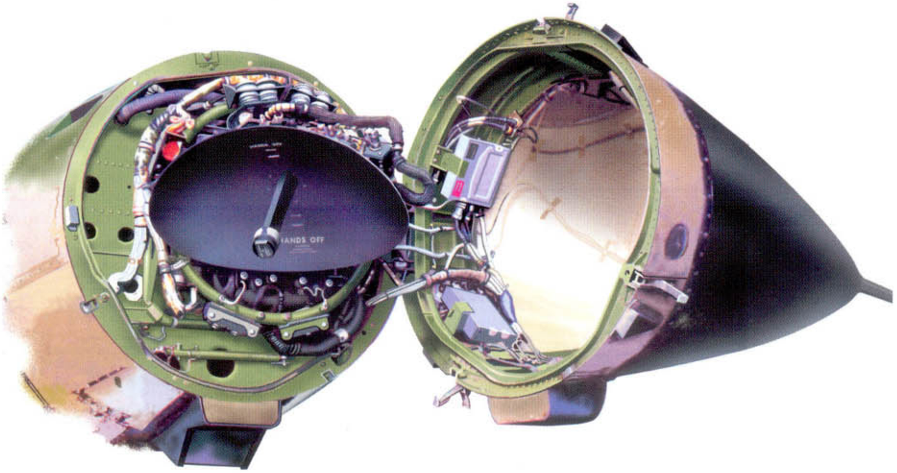


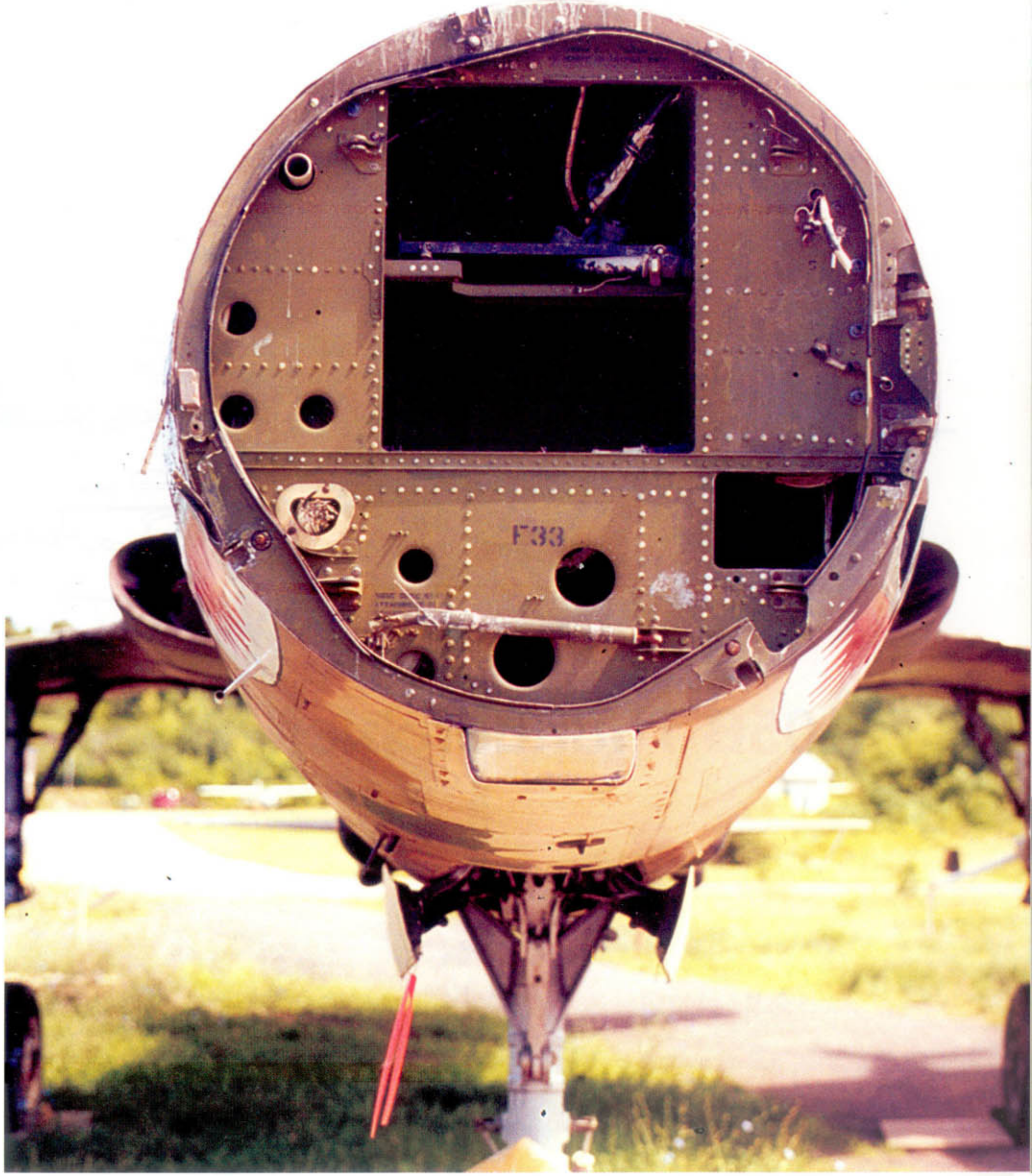
(Below) This F-105D (62-4259) assigned to the 466th TFS was displayed at Eglin AFB, Florida in October of 1982. A practice bomb dispenser is mounted on the centerline external stores rack. The AFRES title on the aft fuselage indicates assignment to the Air Force Reserve. The 466th TFS was the last USAF operator of the Thunderchief, retiring their aircraft on 25 February 1984. (Curtiss Knowles)



The F-105D and the later F-105F/G aircraft featured a lengthened nose over the earlier F-105B. This nose accommodated the larger R-14A search and ranging radar and the General Electric FC-5 automatic flight and fire control system. The 20MM M-63A1 Vulcan cannon remained in place; however, the F-105D's lengthened nose meant the cannon muzzle was further back from the radome. (Curtiss Knowles)

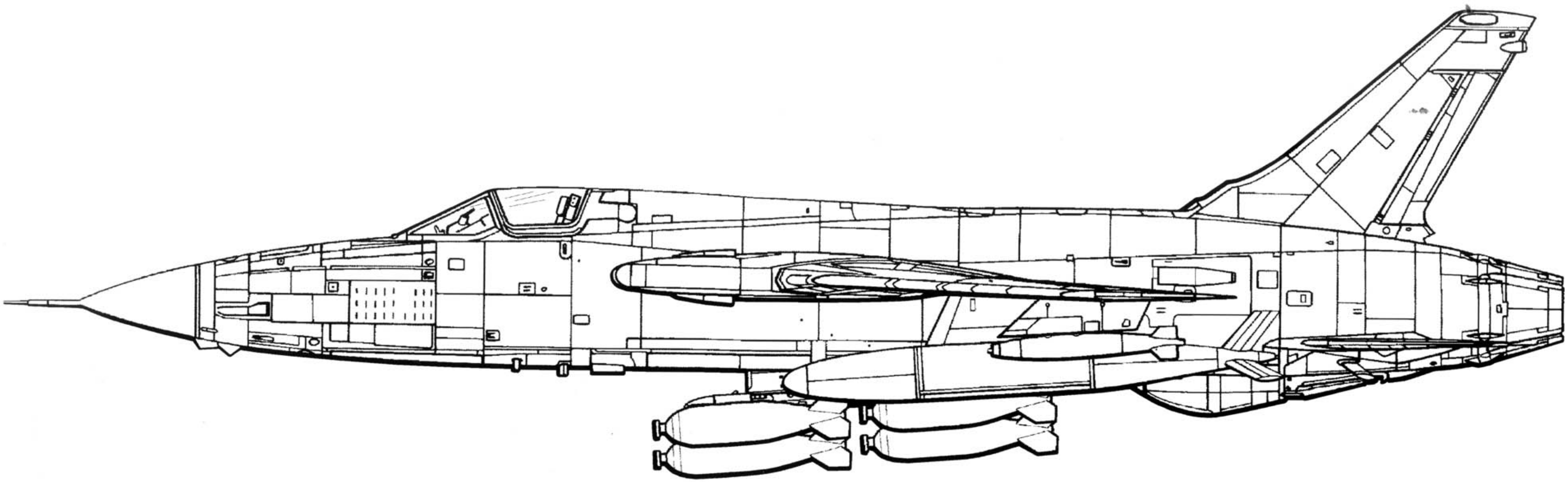
R-14 Radar (F-105D/F/G)



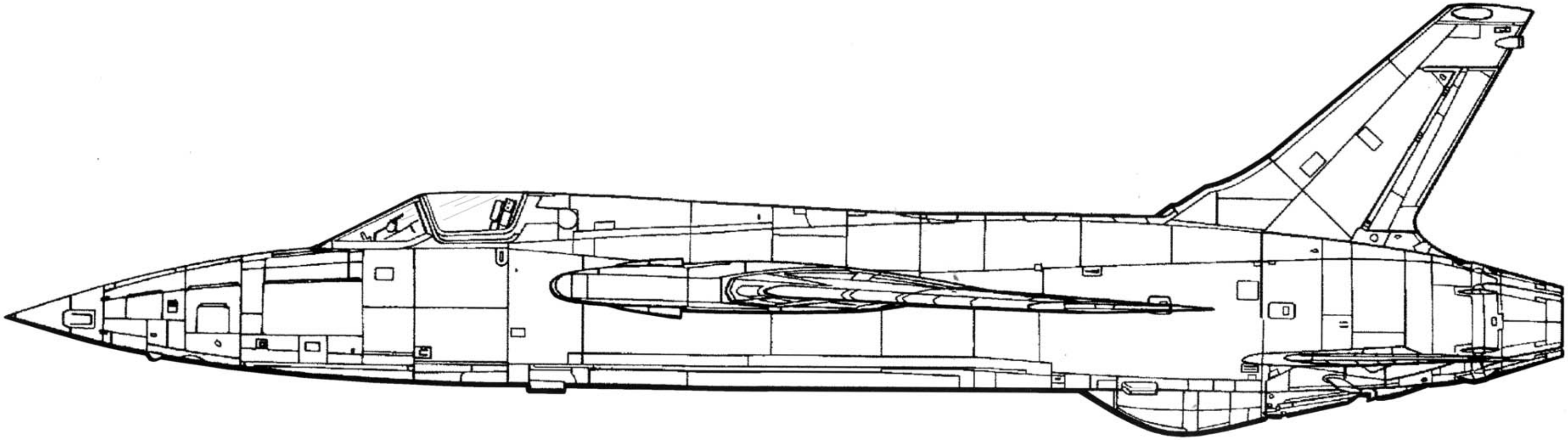


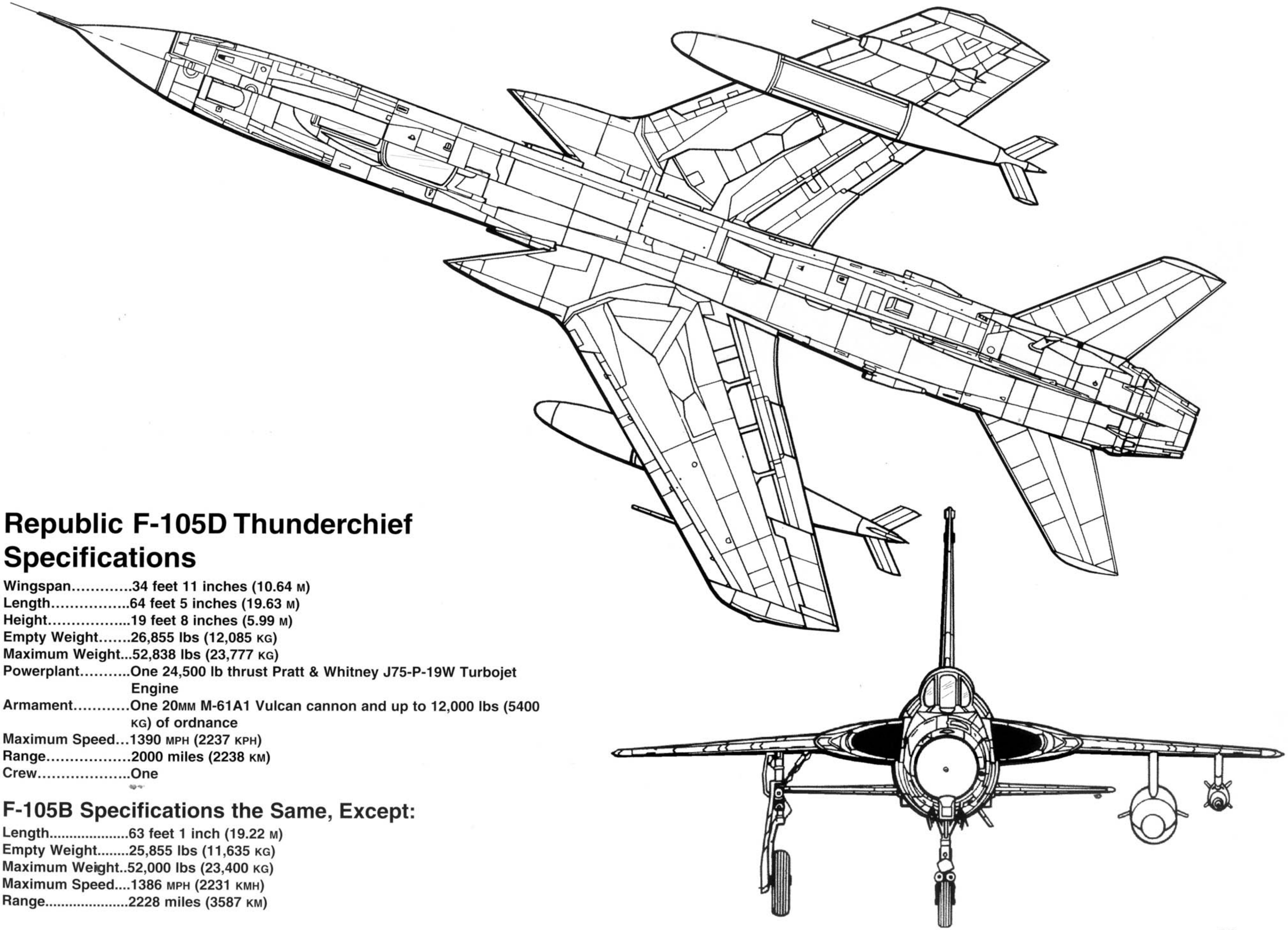
The radome and the R-14 radar were removed from this F-105G to reveal the bulkhead to which the radar set was mounted. The radar mounting and tracking mechanism was mounted in the large rectangular opening in the bulkhead. The fire control radar transmitter and receiver was placed inside the forward fuselage just behind the mounting and tracking mechanism. The radome hinge was placed on the port side of the nose bulkhead.

F-105D Thunderchief



F-105B Thunderchief



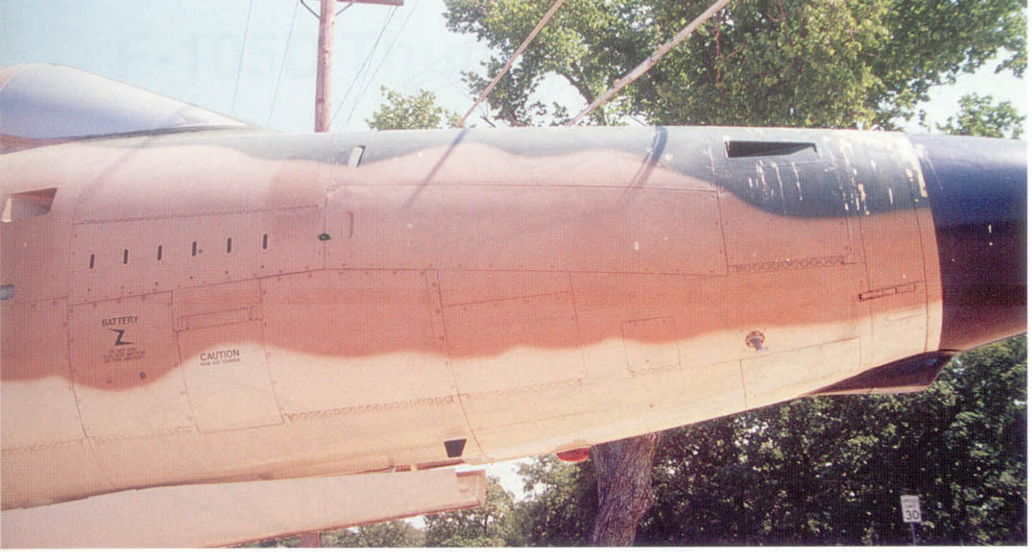


Republic F-105D Thunderchief Specifications

Wingspan	34 feet 11 inches (10.64 m)
Length	64 feet 5 inches (19.63 m)
Height	19 feet 8 inches (5.99 m)
Empty Weight	26,855 lbs (12,085 kg)
Maximum Weight	52,838 lbs (23,777 kg)
Powerplant	One 24,500 lb thrust Pratt & Whitney J75-P-19W Turbojet Engine
Armament	One 20mm M-61A1 Vulcan cannon and up to 12,000 lbs (5400 kg) of ordnance
Maximum Speed	1390 mph (2237 kph)
Range	2000 miles (2238 km)
Crew	One

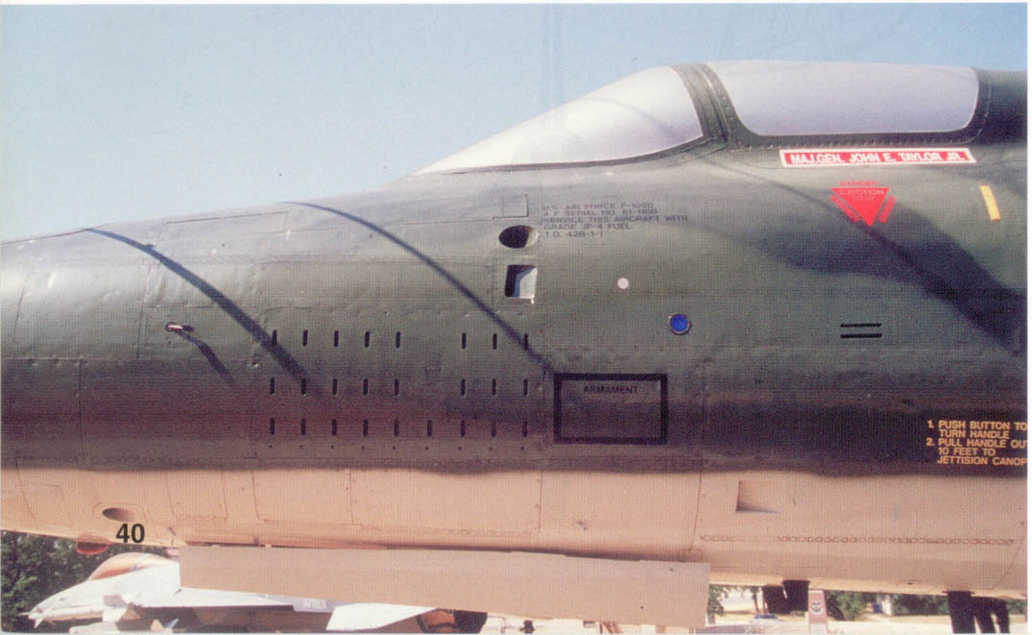
F-105B Specifications the Same, Except:

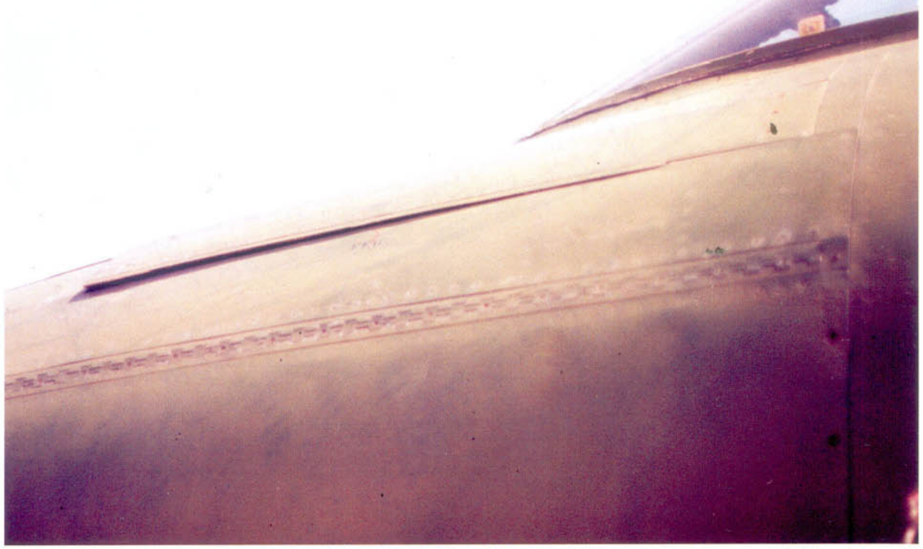
Length	63 feet 1 inch (19.22 m)
Empty Weight	25,855 lbs (11,635 kg)
Maximum Weight	52,000 lbs (23,400 kg)
Maximum Speed	1386 mph (2231 kmh)
Range	2228 miles (3587 km)


BATTERY
CAUTION

The starboard nose of the F-105D included a cooling slot just behind the radome. This slot brought in air to cool the avionics, which generated considerable heat while in use. Panels allowed access to the electronic navigation and fire control equipment, along with the 20mm cannon ammunition drum. The fairing under the base of the radome housed an Electronic Countermeasures (ECM) antenna. An aft-facing strike camera – not fitted behind the ECM fairing – was used to film the attack run's results for later study. (Phillips)

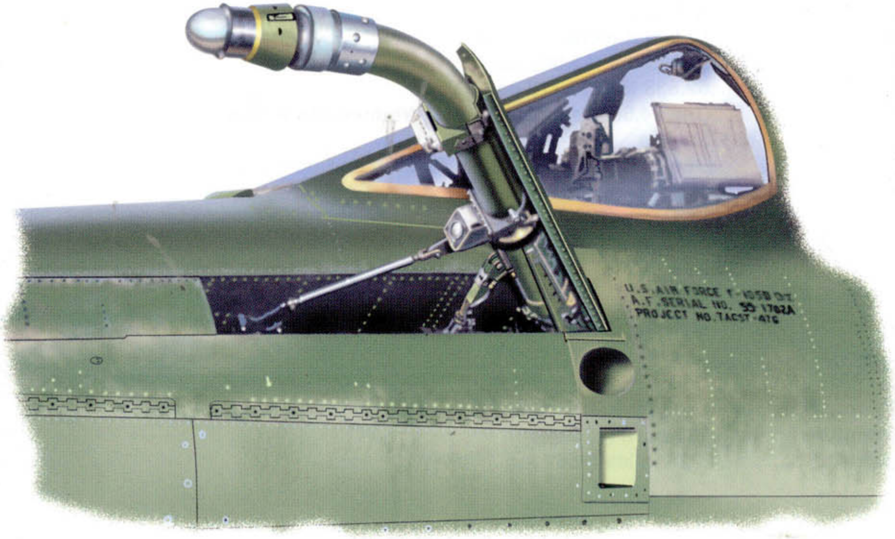
A round blue formation light is placed on the F-105D's forward fuselage; an identical light appears on the starboard side. Crew chiefs chalked external armament information inside the black armament box located immediately behind the 20MM cannon access panel. Emergency canopy release information is stenciled in yellow on the lower fuselage just above the light gray section of camouflage. (Phillips)

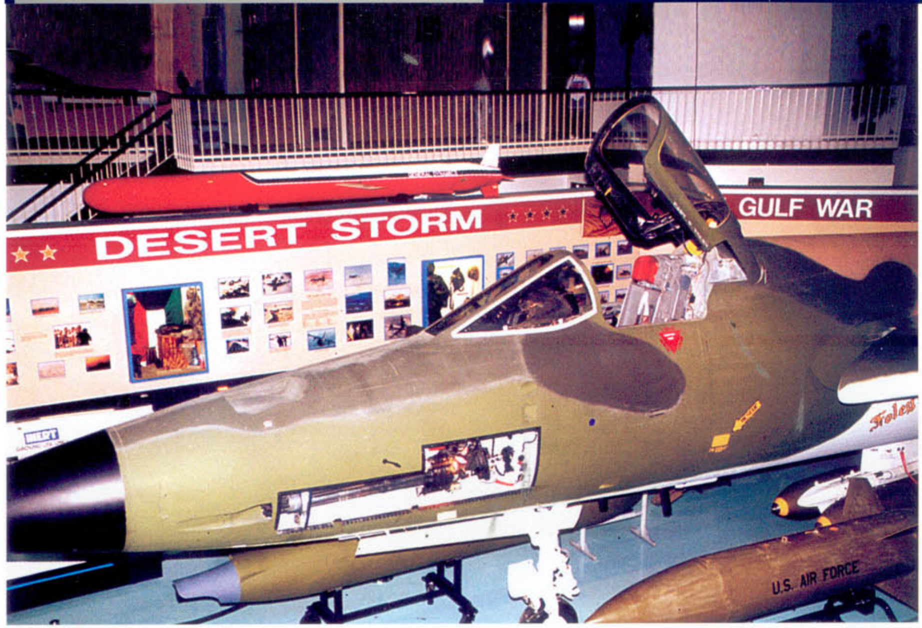

MAJ.GEN. JOHN E. TAYLOR JR.
U.S. AIR FORCE F-105D
A.F. SERIAL NO. 61-1100
SERVICE THIS AIRCRAFT WITH
GRADE JP-4 FUEL
T.O. 42B-1-1
ARMAMENT
1. PUSH BUTTON TO
TURN HANDLE
2. PULL HANDLE OUT
10 FEET TO
JETTISION CANOP



A rectangular door mounted on the nose immediately port of the windshield covers the F-105D's refueling probe. The pilot extended the probe to accept fuel from drogues trailed by tanker aircraft, then retracted the probe when refueling was completed. The top of the 20MM M-61A1 Vulcan cannon servicing panel is parallel to the refueling probe door.

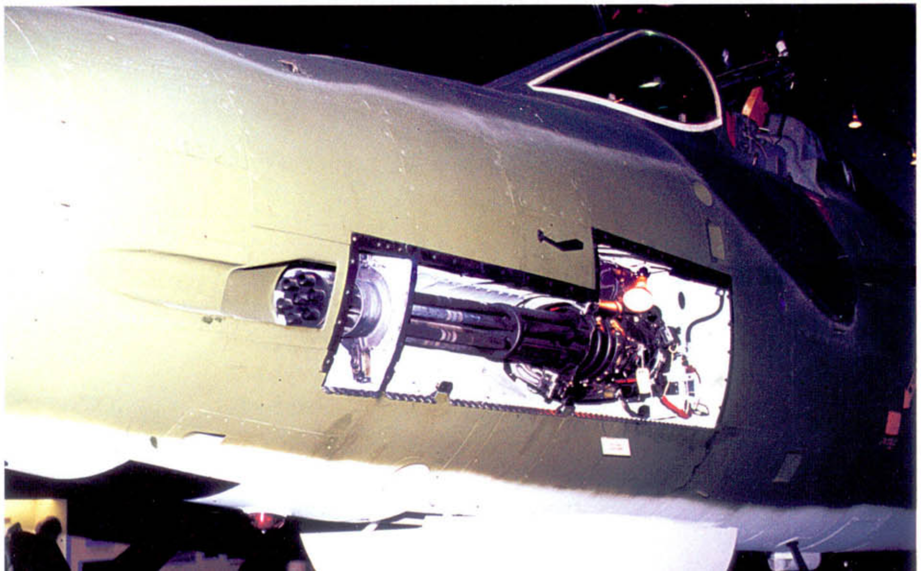
F-105 Refueling Boom

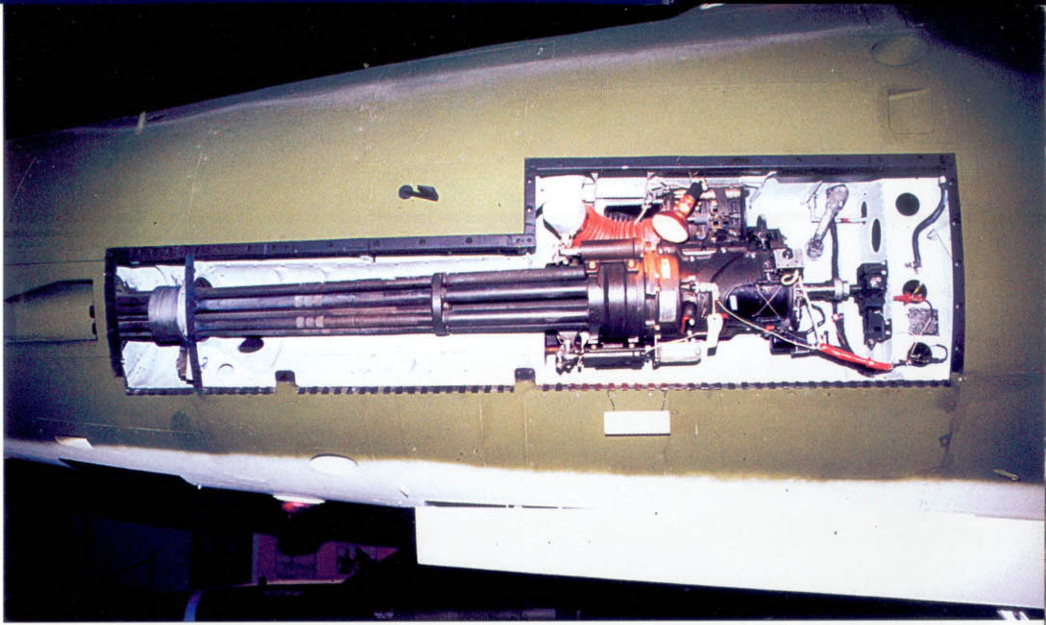

U.S. AIR FORCE F-105D
A.F. SERIAL NO. 59-1702A
PROJECT NO. TACST-



The cannon access doors have been removed from this F-105D to reveal the 20mm M-61A1 Vulcan cannon. All F-105s mounted the cannon offset to port, with the ammunition tank installed to starboard. Space between the weapon and the ammunition supply was taken up by avionics and plumbing for the in-flight refueling system. (Dennis R. Jenkins)

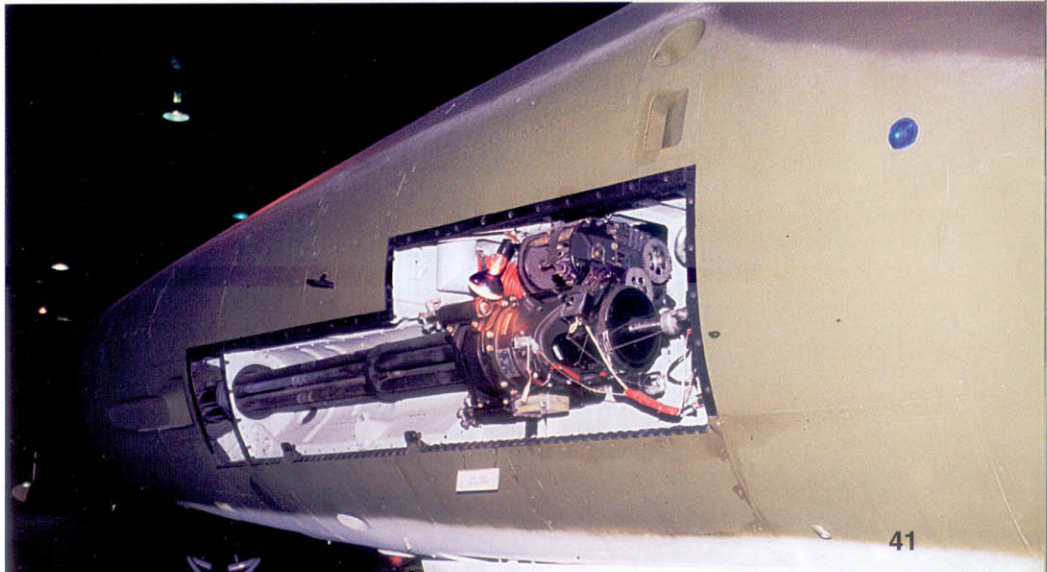
The stainless steel muzzle protection plate has been painted Medium Green (FS34102) on this displayed F-105D; the plate was left unpainted while in service. The 20mm M-61A1 cannon fired the barrel in the 3 o'clock position, looking down the muzzles of the six barrels. Muzzle velocity of the weapon is 3380 feet (1030 m) per second. The angle of attack sensor vane located above the cannon bay warned the pilot of the aircraft stalling and losing lift as a result. (Dennis R. Jenkins)

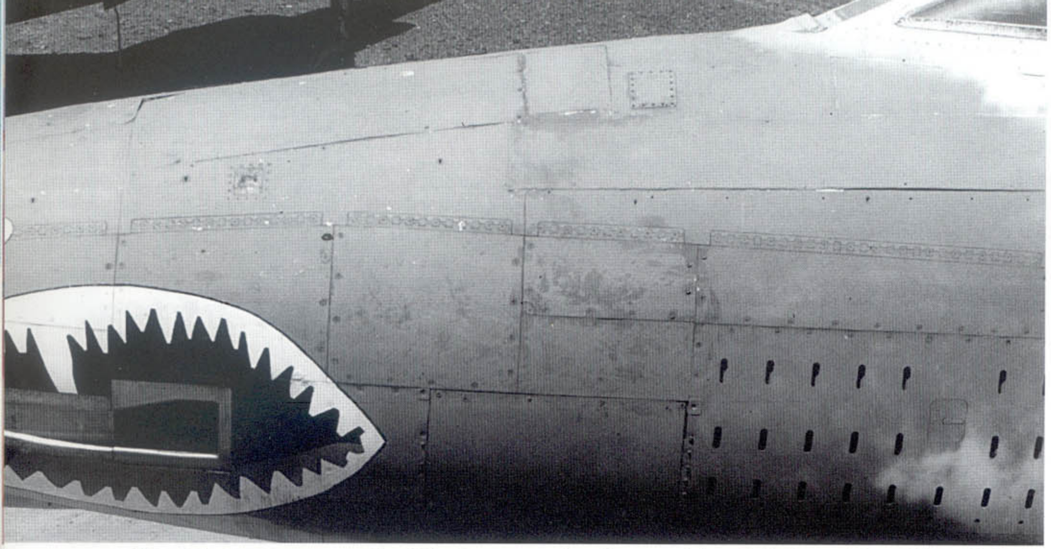




The six barrels of the 20mm M-61A1 Vulcan cannon are driven electrically and are braced at the muzzle, halfway down the barrels, and at the breech. The cannon weighs 252 pounds (113 kg) while its ammunition feed system weighs 292 pounds (131.4 kg). The M-61A1 was introduced into US Air Force service with both the F-105 and the Lockheed F-104 Starfighter during 1958. The light shining on the breech assembly is a museum addition. (Dennis R. Jenkins)

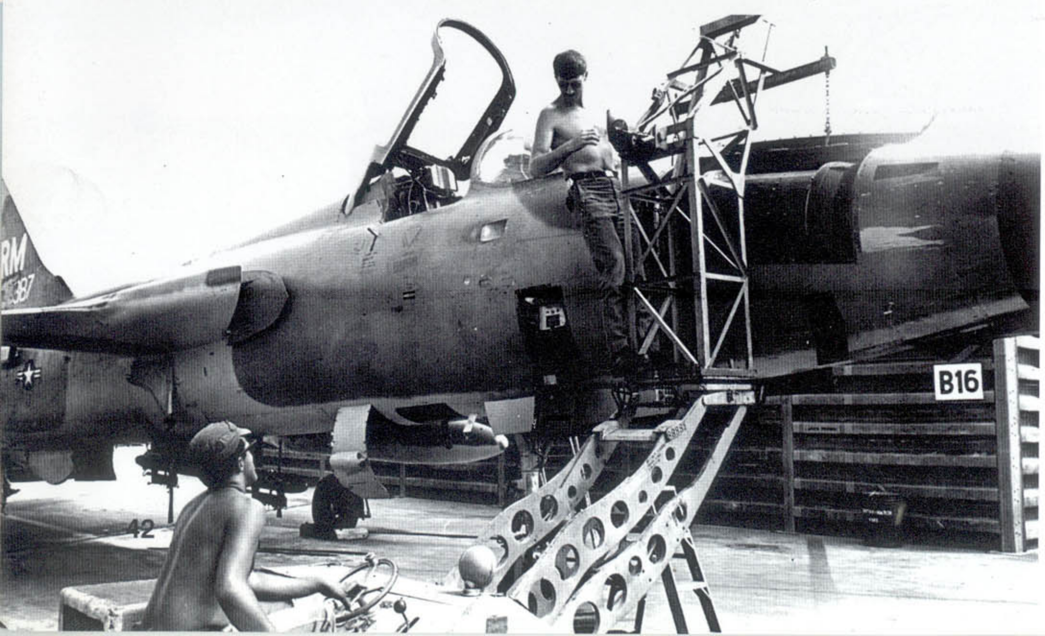
The six barrels of the 20mm M-61A1 Vulcan cannon are turned counterclockwise by a hydraulic drive mounted above the breech. Linkless ammunition is fed from the ammunition tank to the breech of the weapon. The gun bay was normally painted Zinc Chromate (FS34151); however, this museum Thunderchief has a White gun bay. (Dennis R Jenkins)

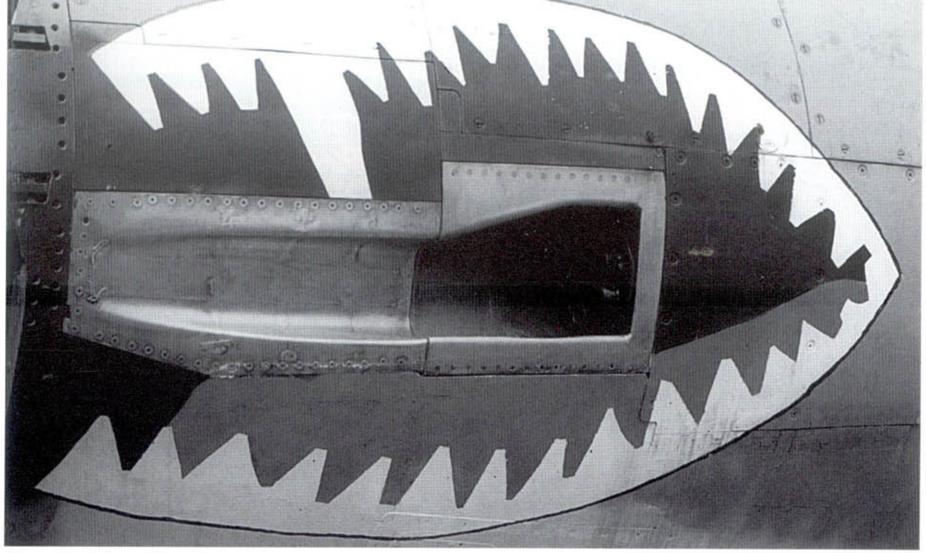




The 20MM cannon remained in the same location on later F-105 models, although their longer noses placed the muzzle further back from the fuselage front than the earlier F-105B. This cannon installation accommodated the additional avionics equipment and the R-14 radar set in a larger nose section than the F-105B's nose. The slits on the cannon bay door allowed gun gases to escape this section of the aircraft and prevented an explosion in the cannon bay.

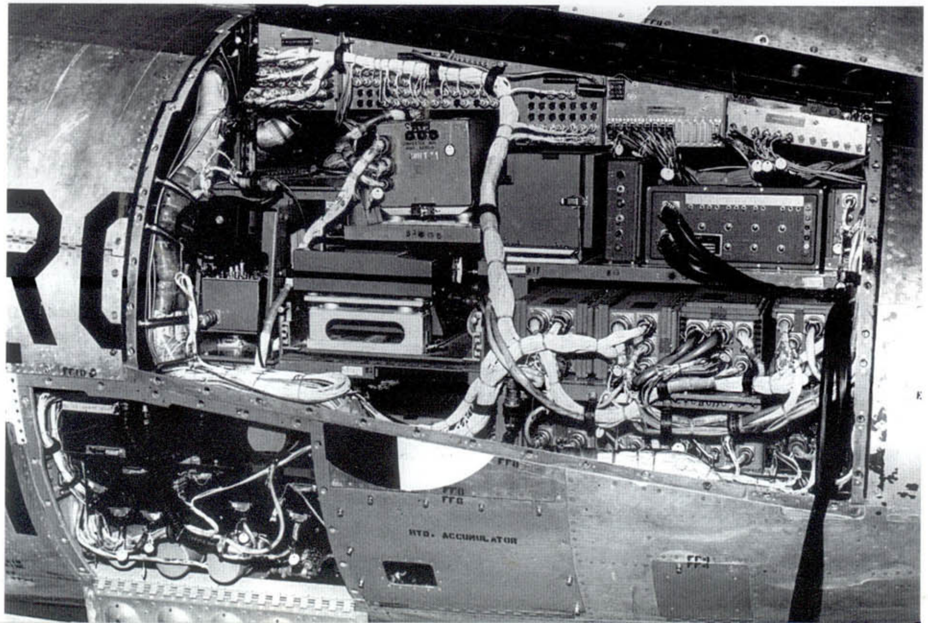
Armorers load a 20MM ammunition drum into the starboard forward fuselage of a 354th TFS F-105D at Takhli RTAB, Thailand on 3 December 1969. The drum held 1028 rounds of 20MM ammunition for the M-61A1 Vulcan cannon. The small access door opened on the lower forward fuselage provided access to the utility and emergency hydraulic systems. The larger opened access door above the nose landing gear door revealed the battery for the F-105's various electrical systems. (Cradle of Aviation Museum)

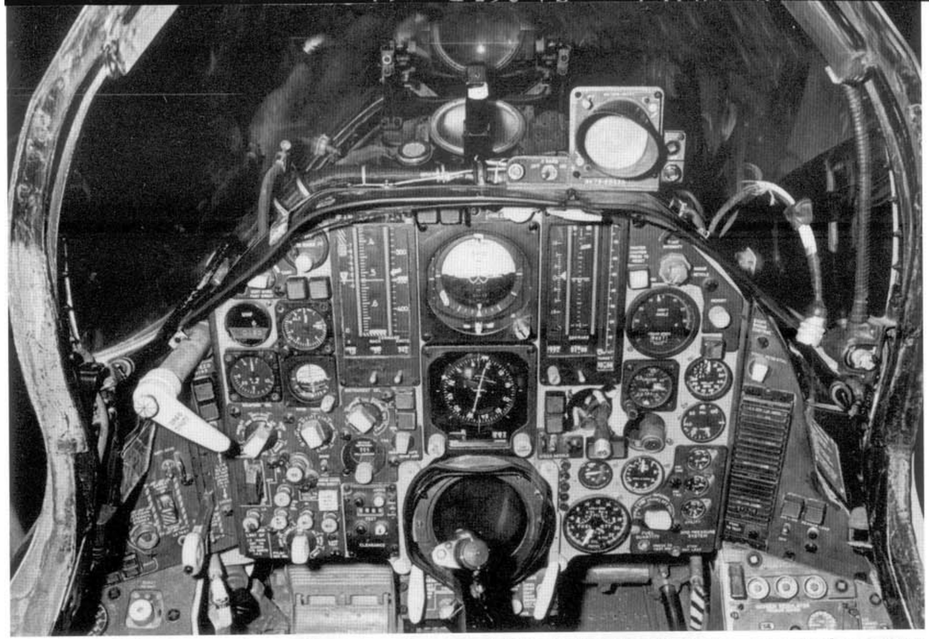




The six 20MM M-61A1 Vulcan cannon barrel muzzles are placed at the aft end of the muzzle opening. This opening is covered with stainless steel sheet metal to protect the fuselage skin from the heat and blast forces generated by the weapon. F-105G ground personnel found the muzzle opening to be the perfect place to paint sharkmouths on the aircraft.

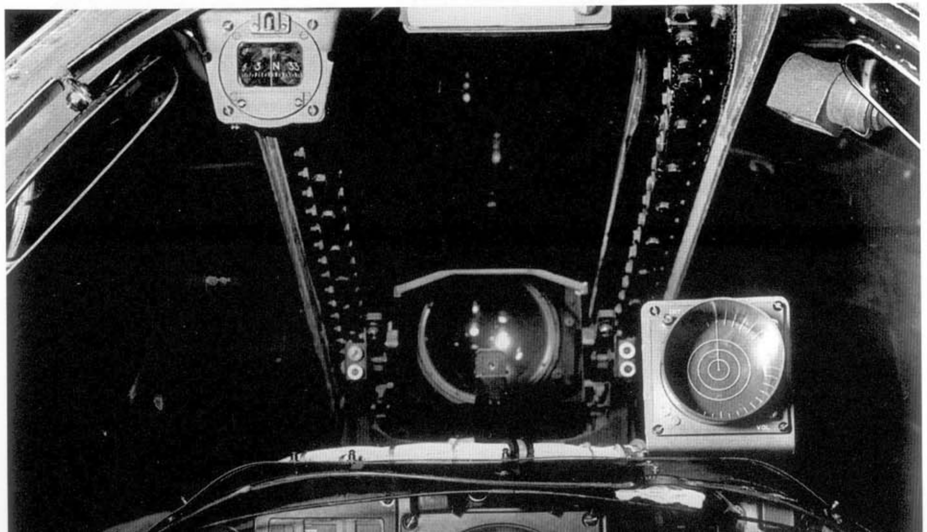
This F-105D's ammunition drum was replaced with electronic testing equipment for trials purposes. The extensive wire harness connects the various electronic units placed inside the avionics bay. The black and white semi-circle on the fuselage below the electronics was part of a test calibration circle. (Cradle of Aviation Museum)

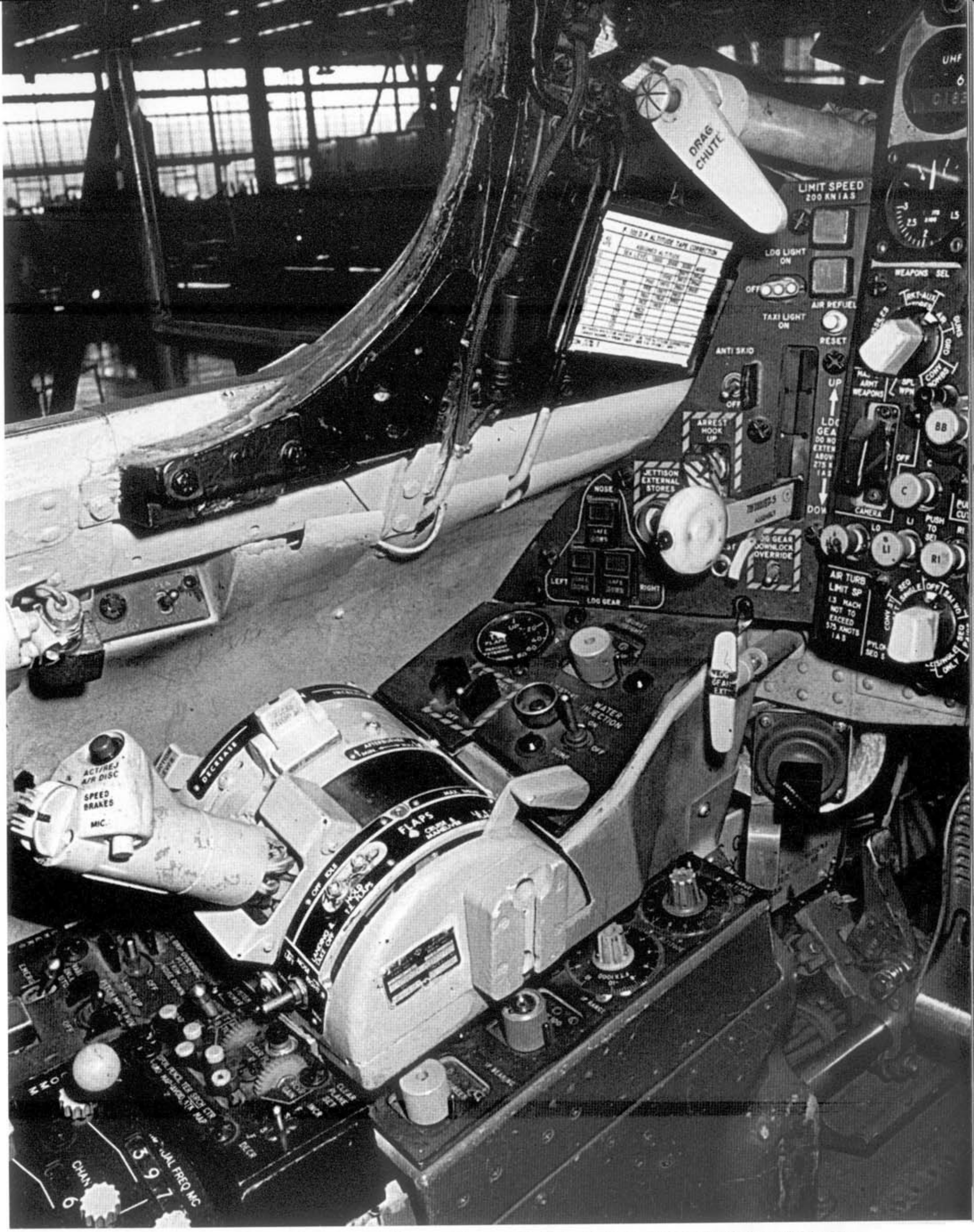




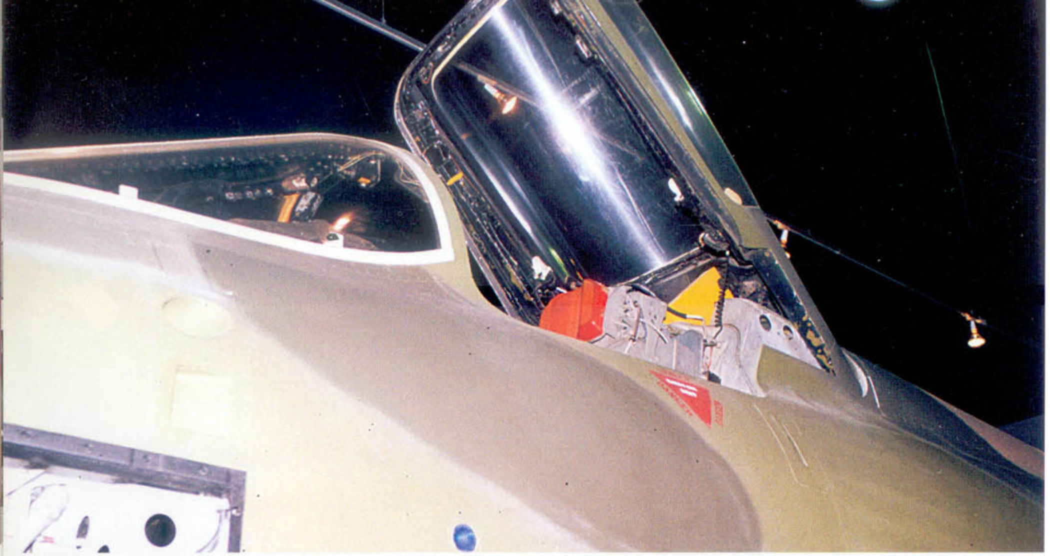
The F-105D instrument panel replaced several F-105B analog instruments at the upper portion with vertical tape indicators. The tape instruments flanking the Attitude Director Indicator are the Airspeed Mach Indicator (left) and the Altitude-Vertical Velocity Indicator (right). The scope for the R-14A radar is placed in front of the control stick grip. The F-105D's revised instrument arrangement provided improved IFR (Instrument Flight Rules) capabilities for the pilot over the earlier F-105B. (Cradle of Aviation Museum)

The Head Up Display (HUD) reflector is mounted immediately in front of the F-105D's instrument panel. The HUD displayed radar navigation and attack information to the pilot. The RHAW (Radar Homing And Warning) scope immediately right of the attack sight warned the pilot of enemy radar emissions. The magnetic compass is mounted on the windshield upper edge to reduce the effects of metal on the compass. Rear view mirrors are mounted along the left and right sides of the windshield. (Cradle of Aviation Museum)



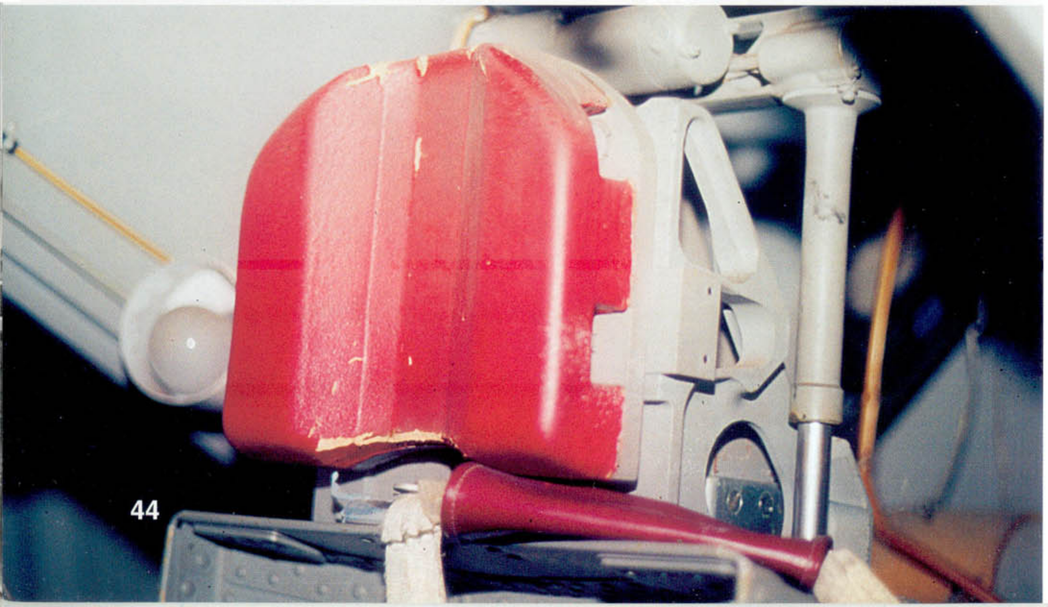

DRAG CHUTE
LIMIT SPEED 200 KNIAS
LDG LIGHT ON
TAXI LIGHT ON
AIR REFUEL
RESET
ANTI SKID
WEAPONS SEL
JETTISON EXTERNAL STORES
ARREST HOOK UP
NOSE
LEFT
RIGHT
LDG GEAR
AIR TURB LIMIT SP
CAMERA
SPEED BRAKES
MIC
FLAPS
WATER INJECTION
CHAN

The R-14A radar control panel was positioned immediately behind the F-105D's throttle quadrant, which included the flap control lever inboard of the throttle. Controls for the Thunderchief's toss bomb computer were placed alongside the quadrant. The round knob forward and above the throttle is the landing gear handle. The drag chute handle was placed at the top of the port auxiliary instrument panel. (Cradle of Aviation Museum)

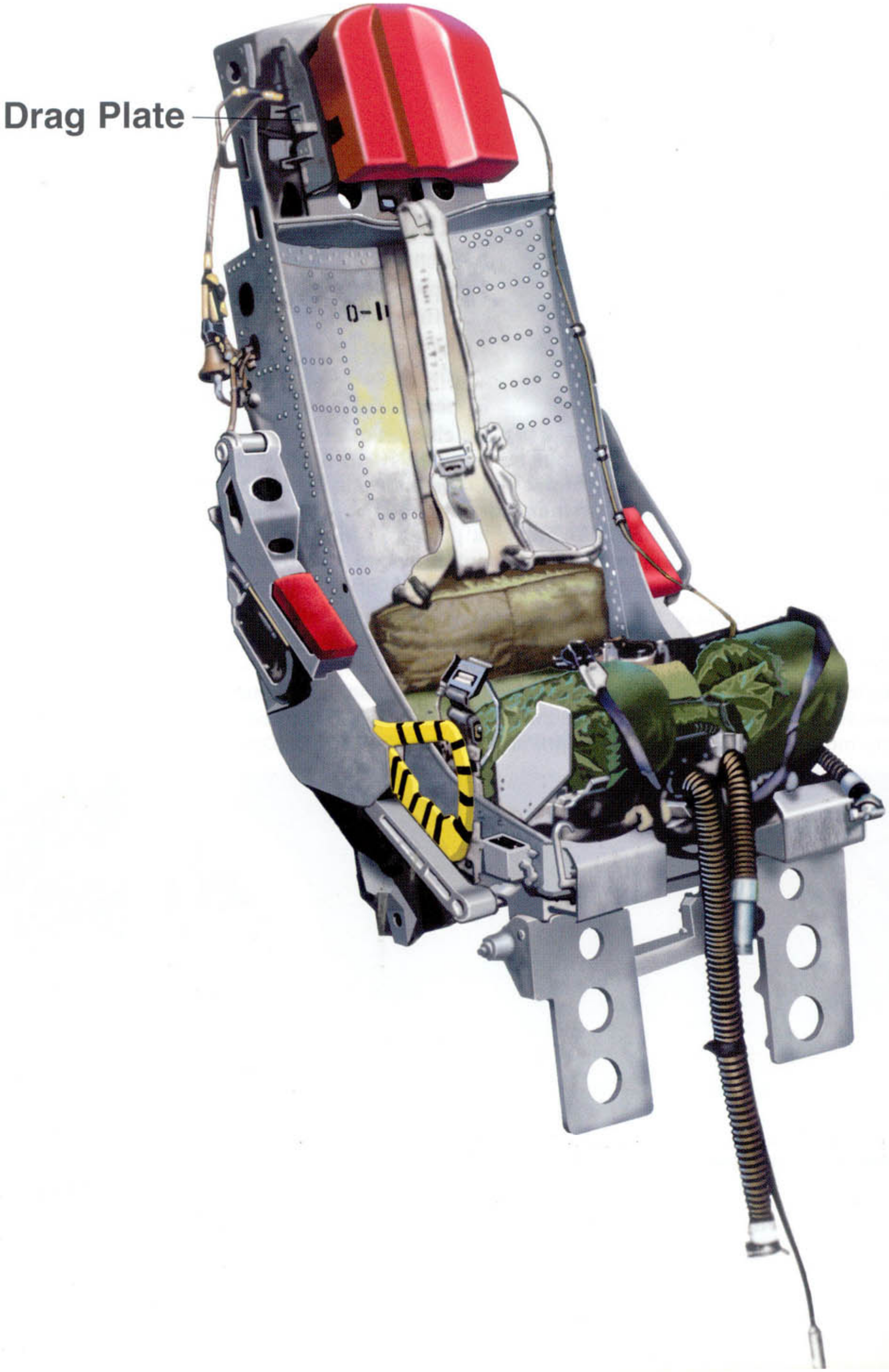


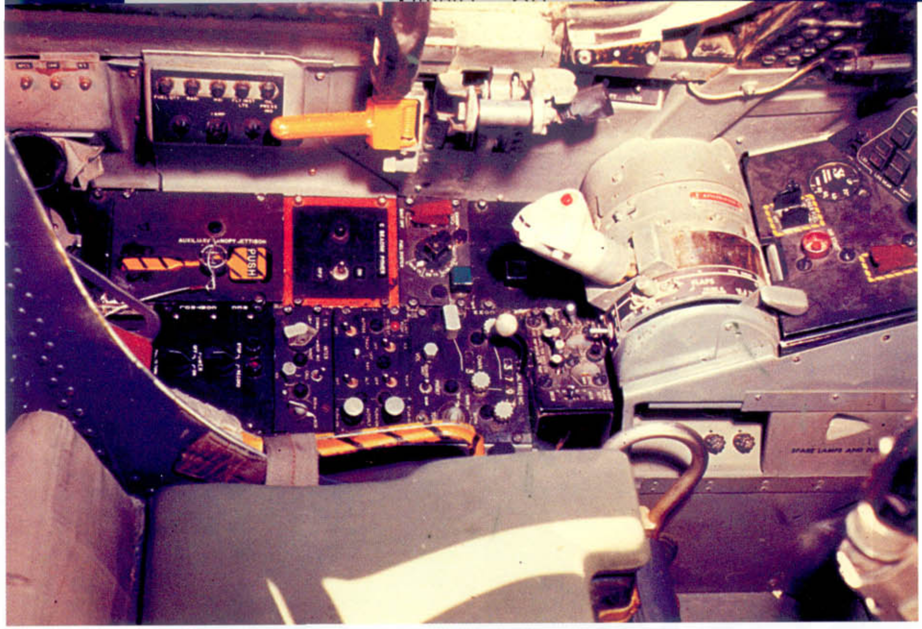
The ejection seat installed in this F-105D has the spring-loaded drag plates fitted beside the headrest. The drag plates extended outward upon ejection to improve the seat's trajectory and stability. The black cords connecting the aft canopy frame and the cockpit bulkhead are believed to supply power for the canopy demisting system. The yellow block of wood was used by the museum to prop open the Thunderchief's canopy for display. (Dennis R. Jenkins)

The armored headrest of the F-105 ejection seat is missing its flanking drag plates, which were normally installed on the seat. The headrest was attached to structural components which formed the top of the ejection seat frame. The drogue chute which stabilized the seat upon ejection is fitted behind the headrest. The pilot could electrically adjust the seat's height to suit his external vision needs. This seat was unique to the F-105. The light bulb over the right shoulder was added by the museum displaying this Thunderchief.



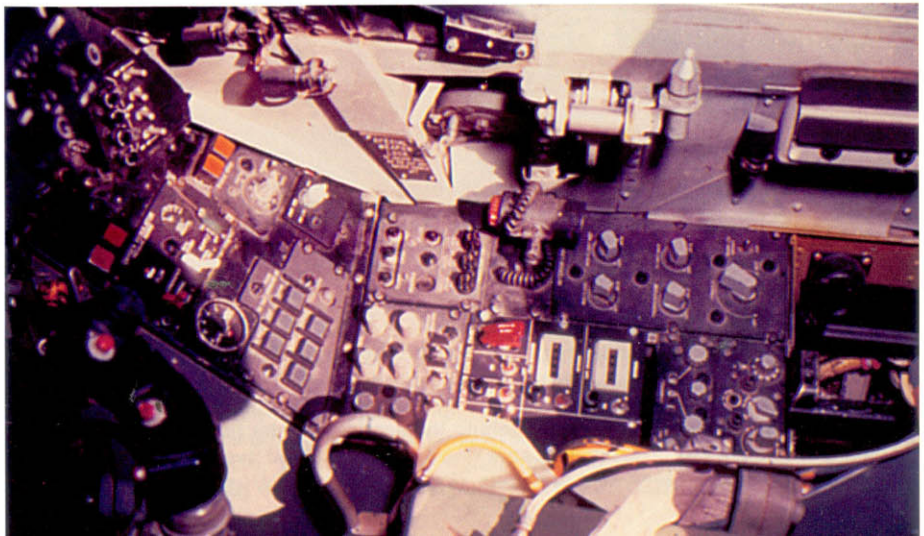
F-105 Ejection Seat

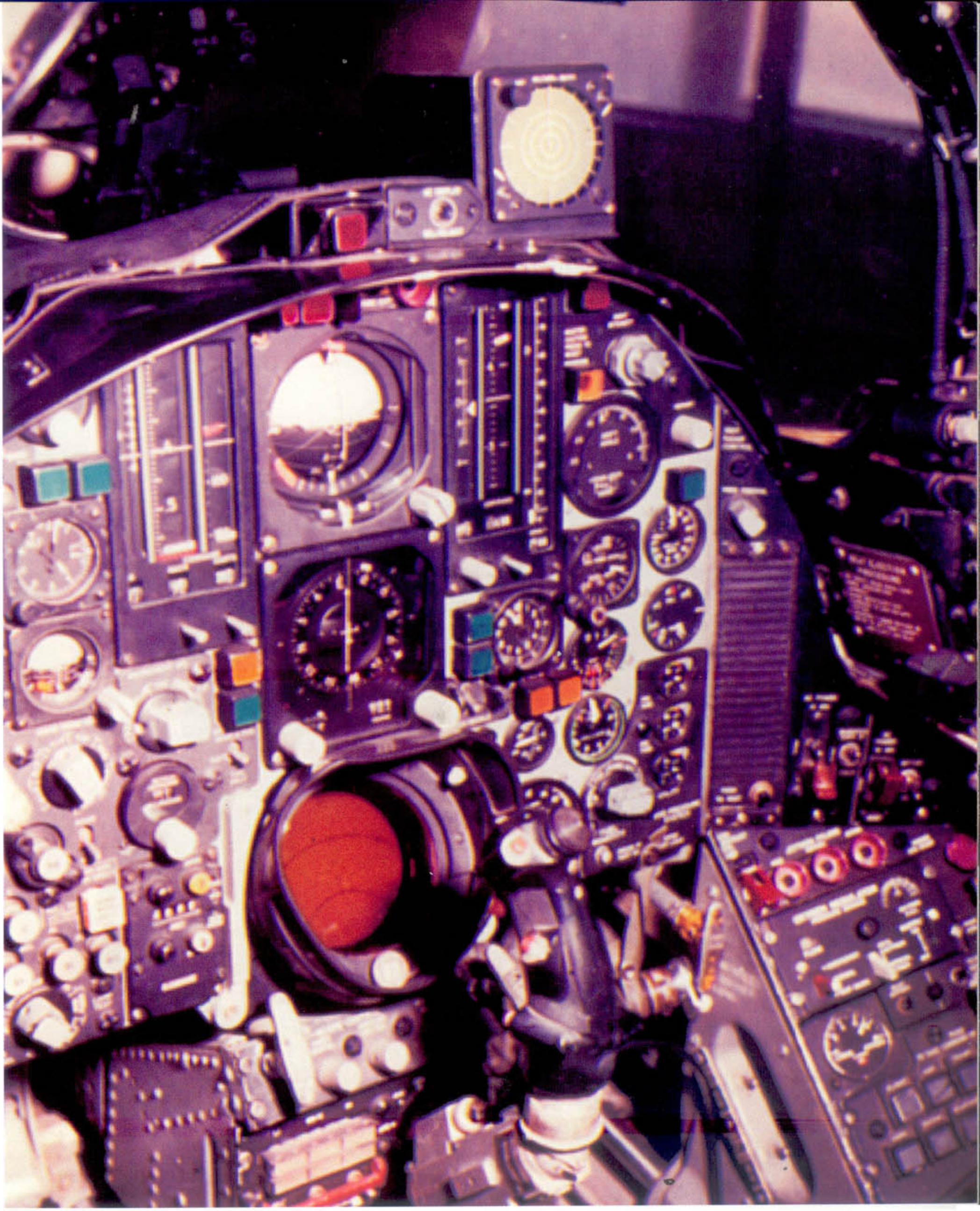




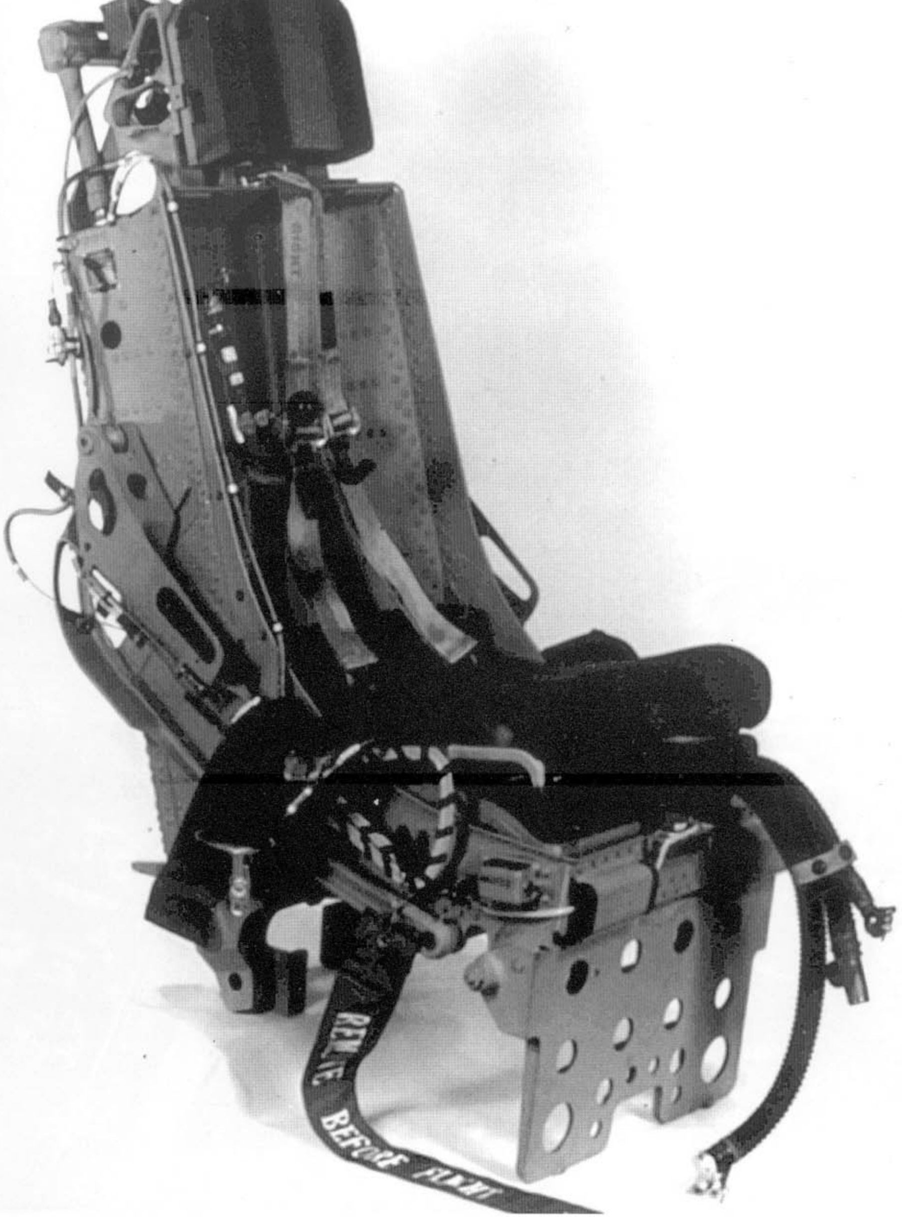
The port forward cockpit console on the F-105G was virtually identical to the F-105D's console. The yellow handle mounted under the canopy sill was the canopy lock lever, used to lock the canopy before flight or to unlock it after landing. The red button immediately ahead of the throttle quadrant was the aircraft's engine start button. The black and yellow striped handle at the aft portion of the console was the auxiliary canopy jettison handle.

The forward portion of the F-105G's right forward cockpit console contained the oxygen system regulator and controls. The black button on top of the control stick was the pitch and roll trim switch for fine-tuning flight control. The red freeze fire button located beside the trim switch maintained gun firing parameters during an attack. The lower red button on the stick grip activated the weapons sight electric cage and range cursor. The range cursor displayed radar slant ranges for the pilot during an attack run.

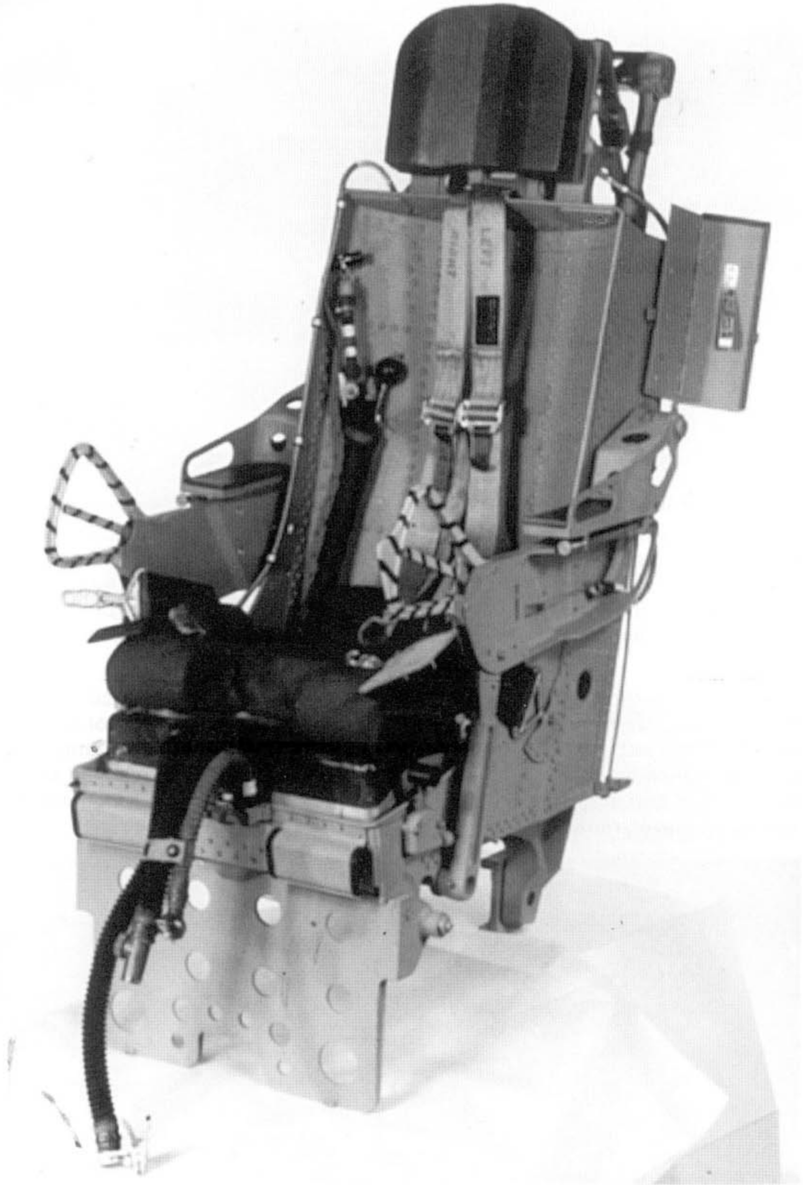




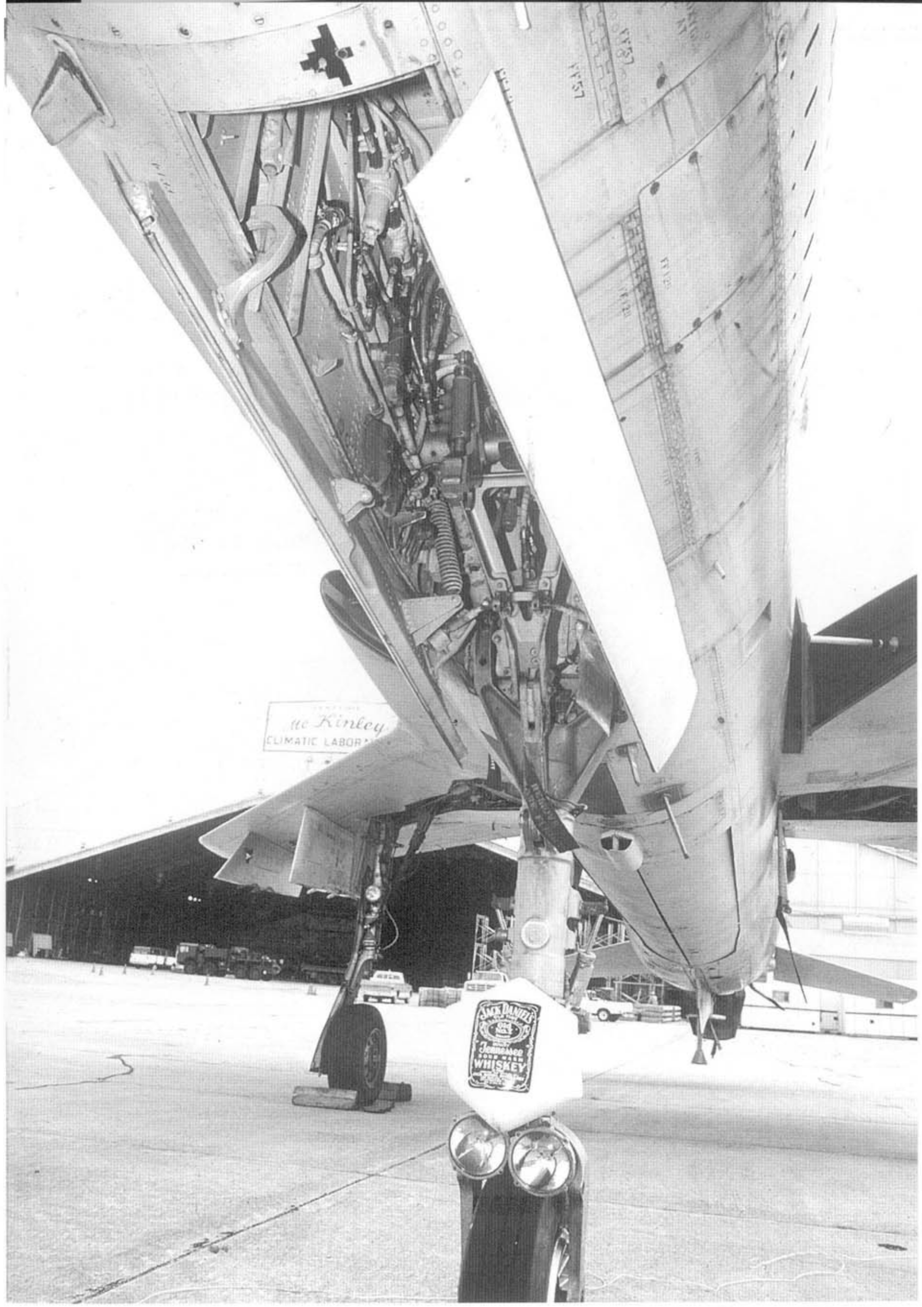
A RHAW (Radar Homing And Warning) scope was added to the forward instrument panel shroud of an F-105G to provide warning of radars tracking the aircraft. Aircraft performance, engine, and fuel instruments were placed on the starboard side of the instrument panel. Armament controls were located immediately left of the radar scope at the bottom of the panel. Basic cockpit color was Interior Gray (FS36231) with Black consoles and instrument housings.



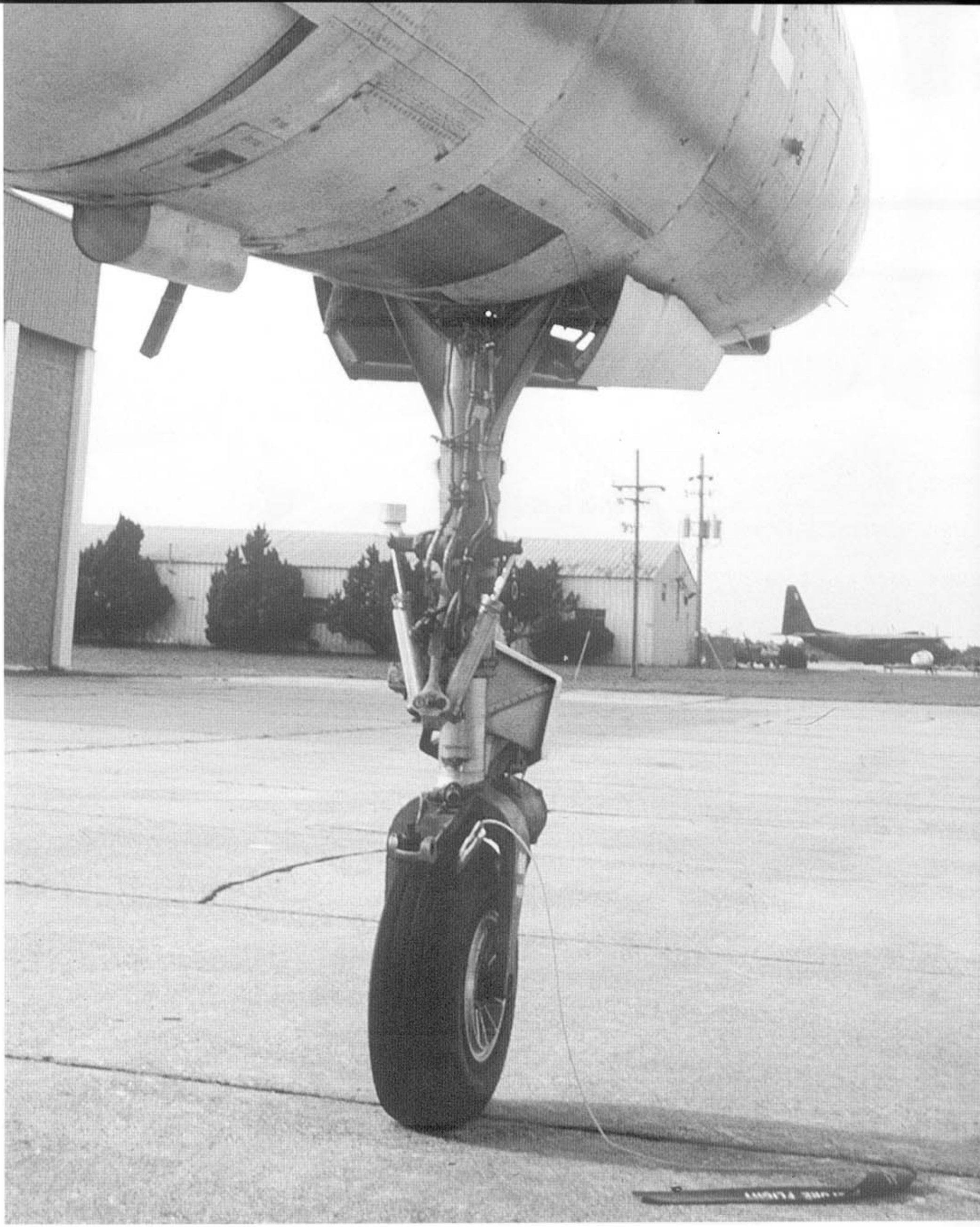
Republic developed a unique ejection seat for the F-105 Thunderchief; this seat was not used on any other US Air Force aircraft. The ejection seat was a self-contained unit, which incorporated a headrest and a seat bucket with a survival kit. The survival kit included food rations and equipment the pilot needed for survival until rescued. (Cradle of Aviation Museum)



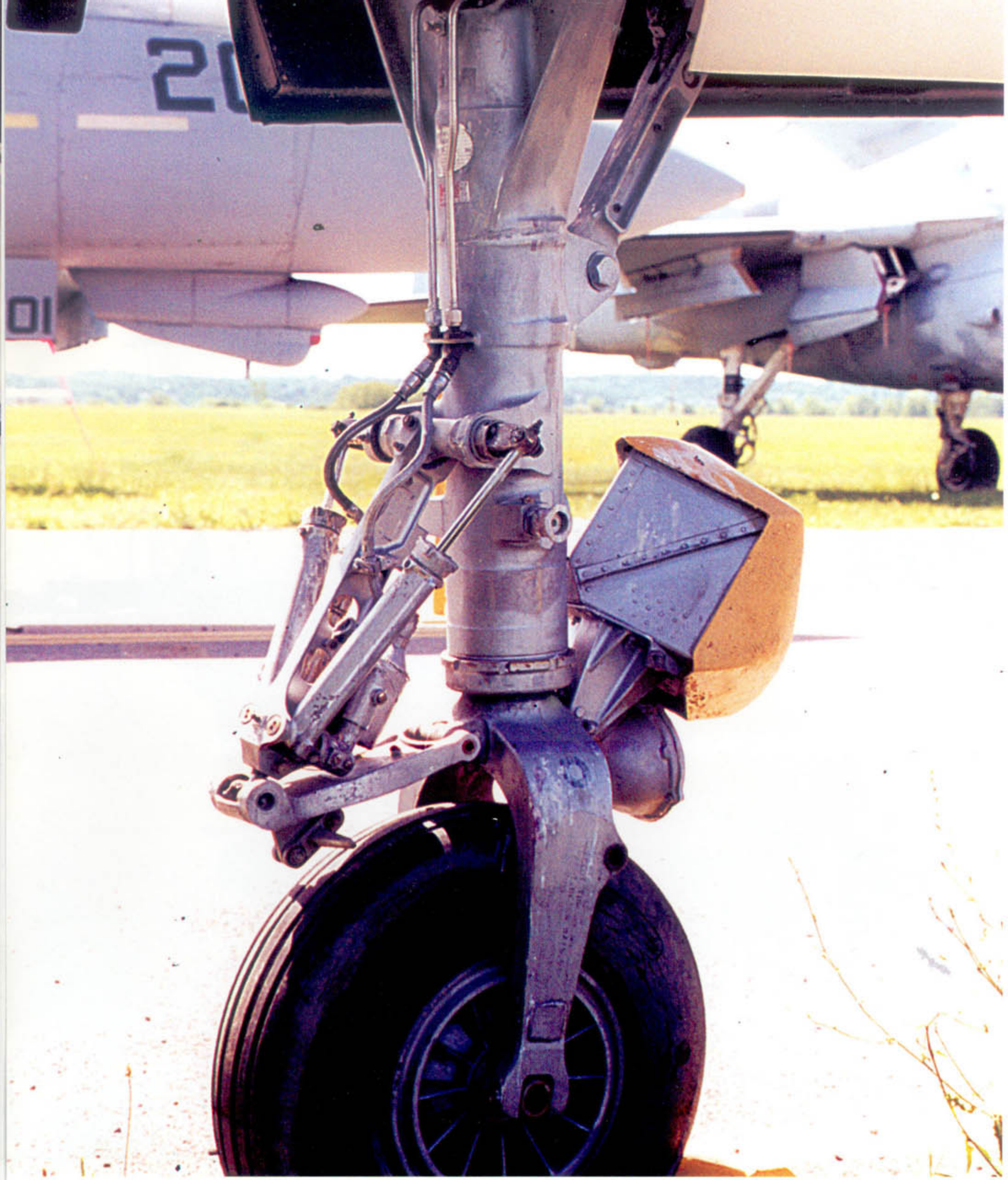
The F-105 pilot initiated ejection by pulling forward one or both yellow and black striped handles at the front of the seat. The pilot wore a back-mounted parachute, which fit within the cavity of the seat back. The seat and pilot separated automatically after ejection. The seat-man separator was mounted behind the seat's shoulder harness and is activated by high pressure gas. The ejection seat was normally painted overall Interior Gray with red headrest and dark green seat cushions. (Cradle of Aviation Museum)



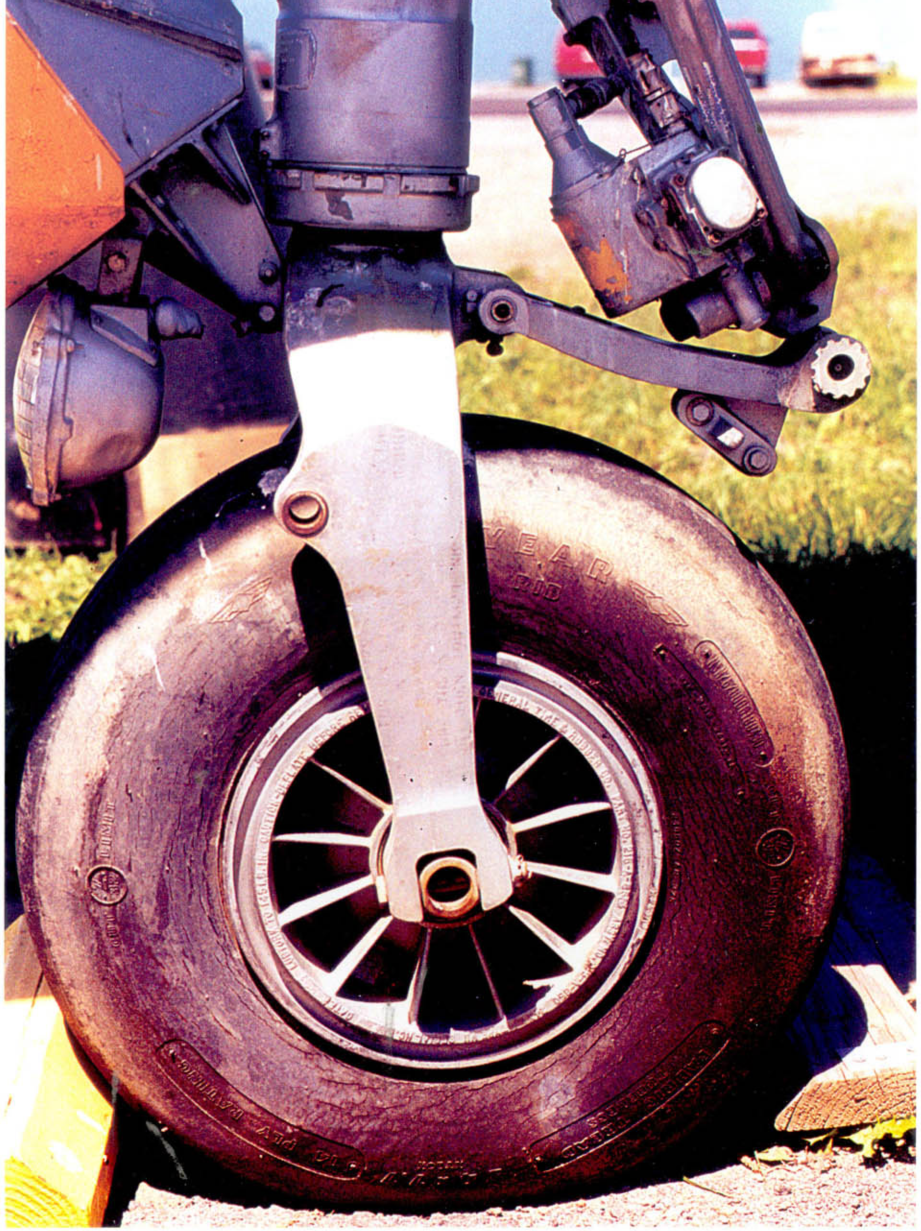
The F-105D's nose landing gear well included various hydraulic and electrical lines running along its sides and top. The main gear strut with single wheel and tire retracted upwards and forwards, with the wheel lying in the front of the gear well. A white cover has been placed over the ILS (Instrument Landing System) radar reflector mounted above the nosewheel. The reflector bounced radar signals back to ILS antennas on the ground, which were received by the aircraft's AN/ARN-61 ILS radio. (Curtiss Knowles)



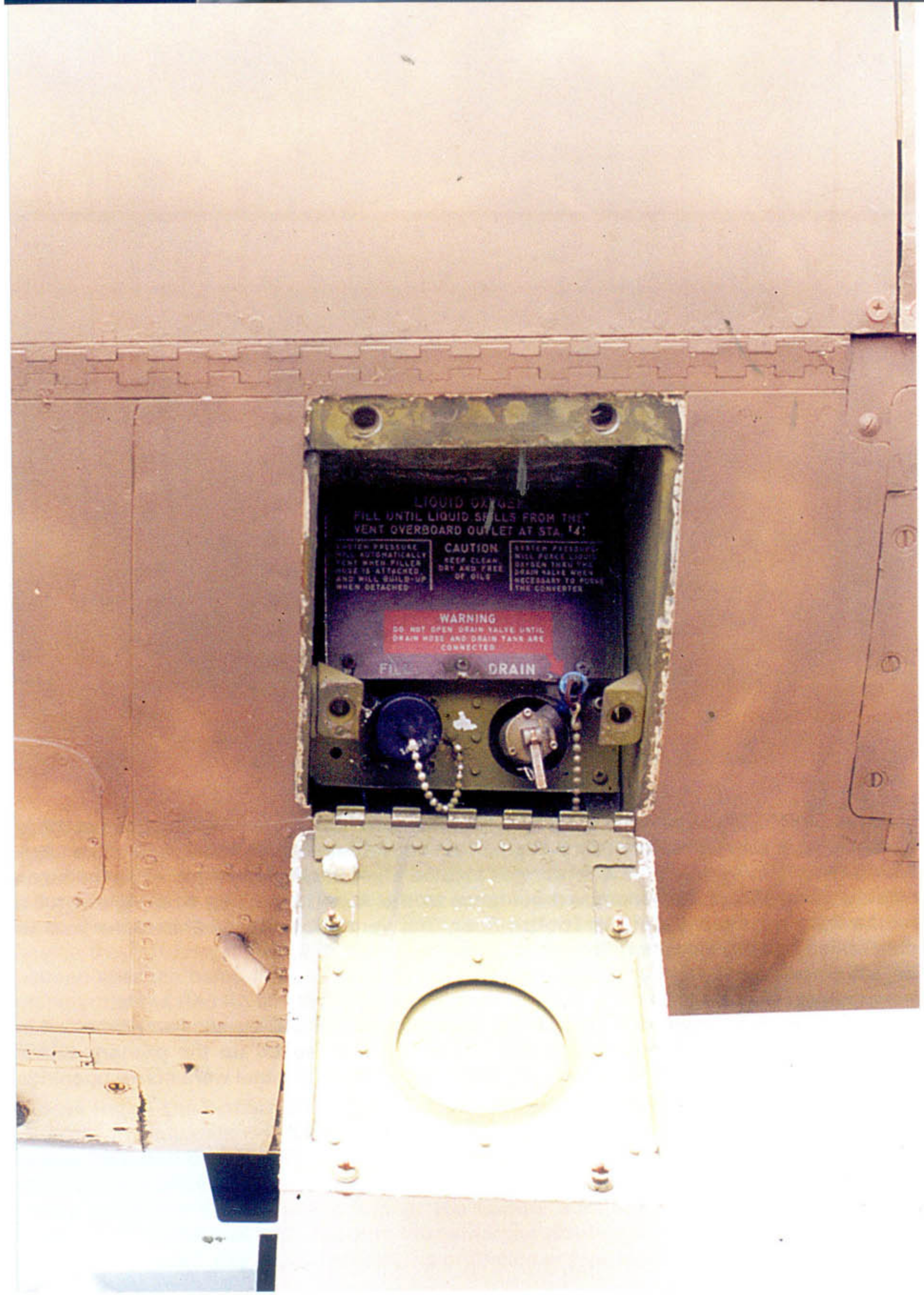
A pair of side-mounted doors, which completely covered the landing gear upon retraction, enclosed the F-105's nose landing gear bay. Immediately behind the F-105D's nose gear well is the antenna for the AN/ARW-73 guidance system used with GAM-83 (later AGM-12) Bullpup Air to Surface Missiles (ASMs). The AN/APN-131 Doppler guidance radar is fitted behind the AN/ARW-73 antenna. A cooling duct for the fuselage avionics compartment is placed immediately ahead of the bomb bay. (Curtiss Knowles)



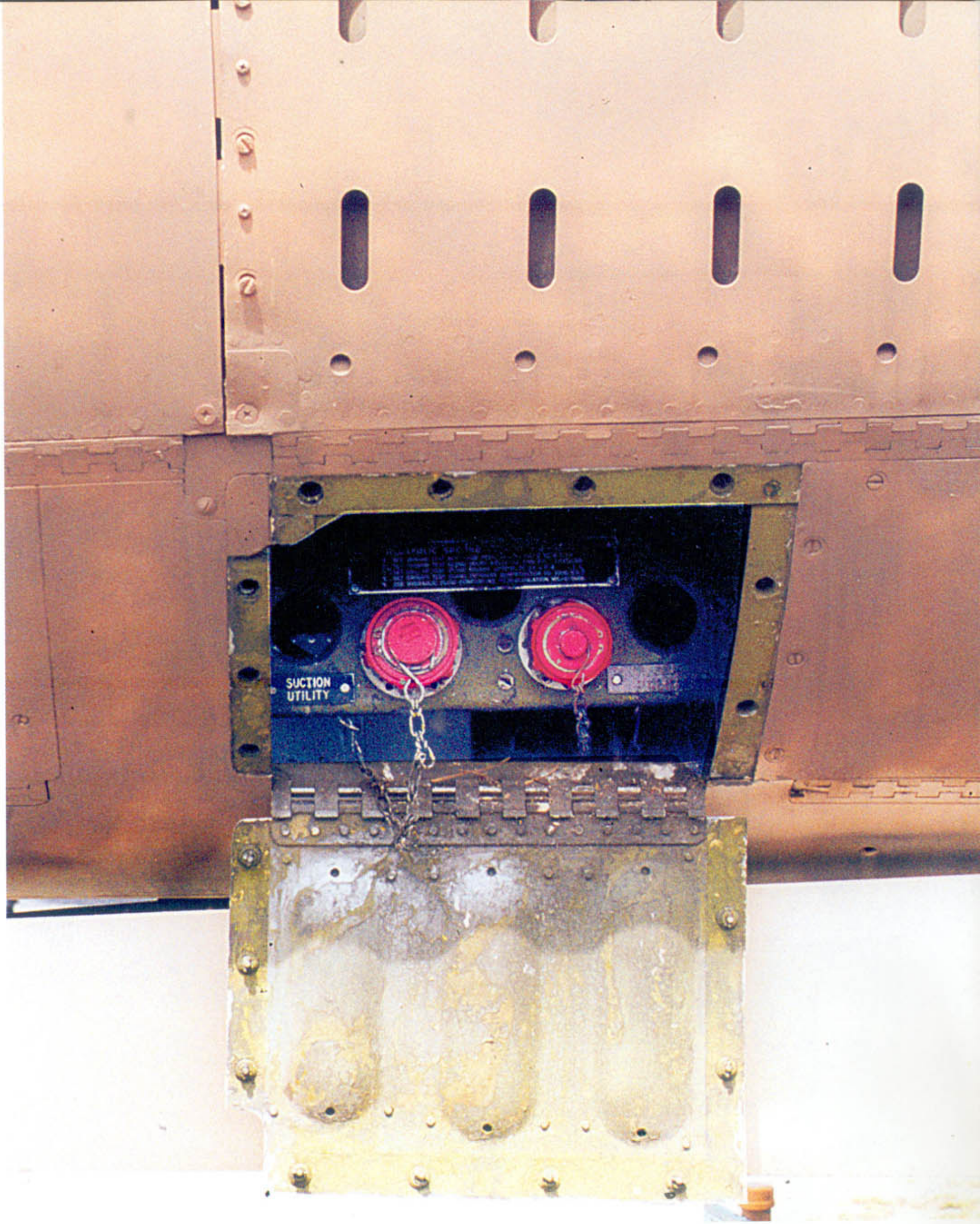
All F-105 models used the same nose landing gear strut assembly. The landing gear hydraulically retracted forward into the nose wheel well. The extended nose wheel steering assembly is pressing against the torque arm assembly. A brake pad held by the torque arms is pushing against the top of the nose wheel tire. The nose landing gear assembly and nose wheel are painted Aluminum.



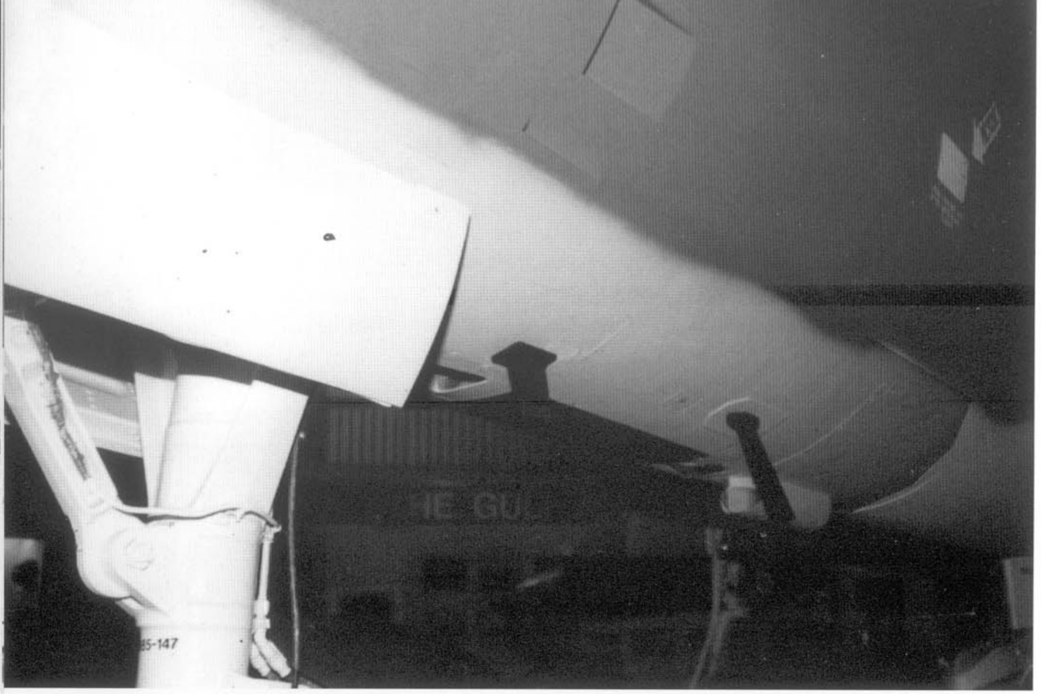
The nose wheel steering system for all F-105s used a dual hydraulic actuator assembly mounted in front of the landing gear strut. The actuator assembly engaged the torque arms, which are extended to indicate nose wheel steering system engagement. Nose wheel steering was used until the rudder became effective at 60 knots (68.9 MPH/110.9 KMH). The Goodyear nose wheel tire was inflated to 140 pounds per square inch (PSI), while the main wheel tires were inflated to 205 PSI.

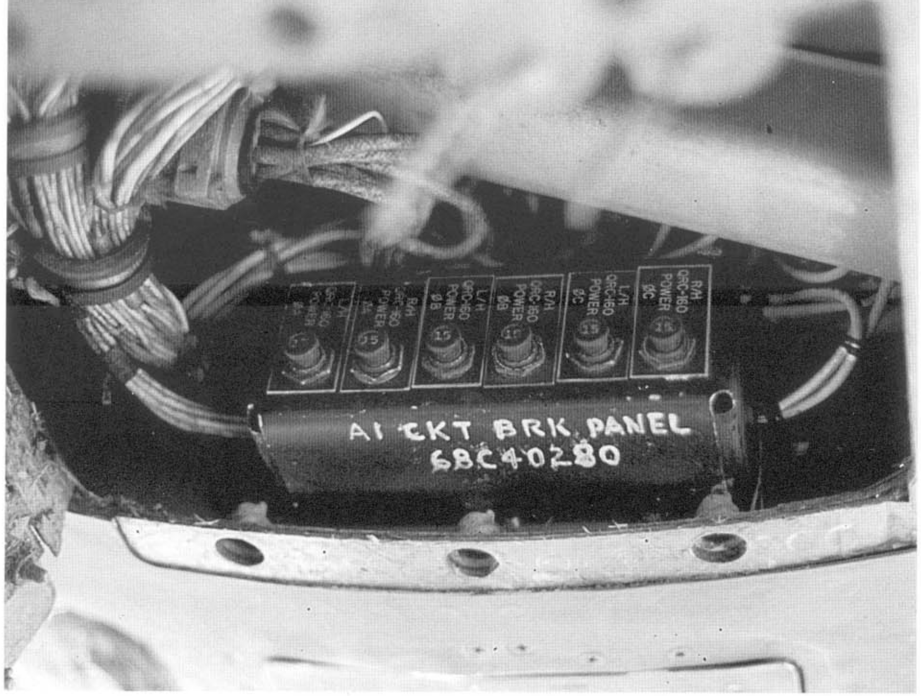

LIQUID OXYGEN
FILL UNTIL LIQUID SPILLS FROM THE VENT OVERBOARD OUTLET AT STA 141
CAUTION
WARNING
FILL
DRAIN

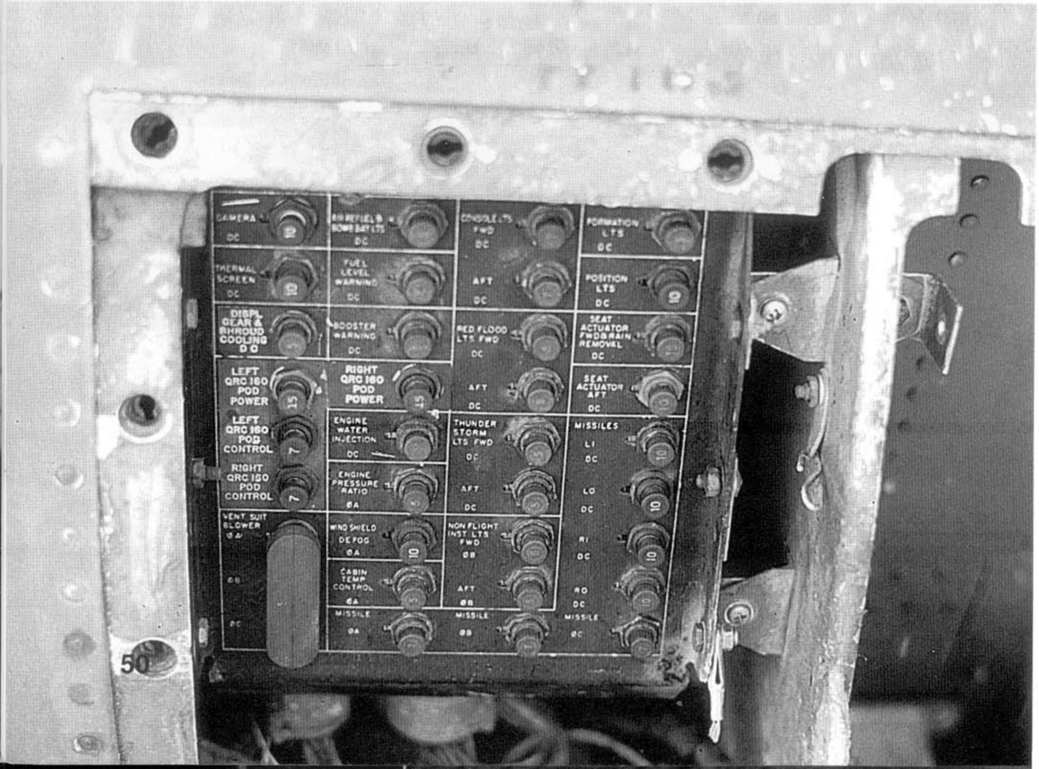
The liquid oxygen access door is positioned above the F-105G's port nose landing gear door. The fill cap for adding liquid oxygen is facing forward, while the drain cap is aft. The F-105 used 2.6 gallons (10 L) of liquid oxygen, which was converted to gaseous oxygen for breathing by the flight crew. The interior of the access door and bay is Zinc Chromate with a black and red panel. The fill cap is black while the drain is steel.


SUCTION
UTILITY

The utility hydraulic system receptacle is located under the cannon access door on the F-105G's port nose. Two red filler caps are each connected with chains to the receptacle to prevent their loss. The utility hydraulic system supplied hydraulic pressure to various aircraft systems, including the landing gear, speed brakes, wheel brakes, and bomb bay doors. Two individual primary hydraulic systems – duplicated in the event of one system failing – operated the flight controls.



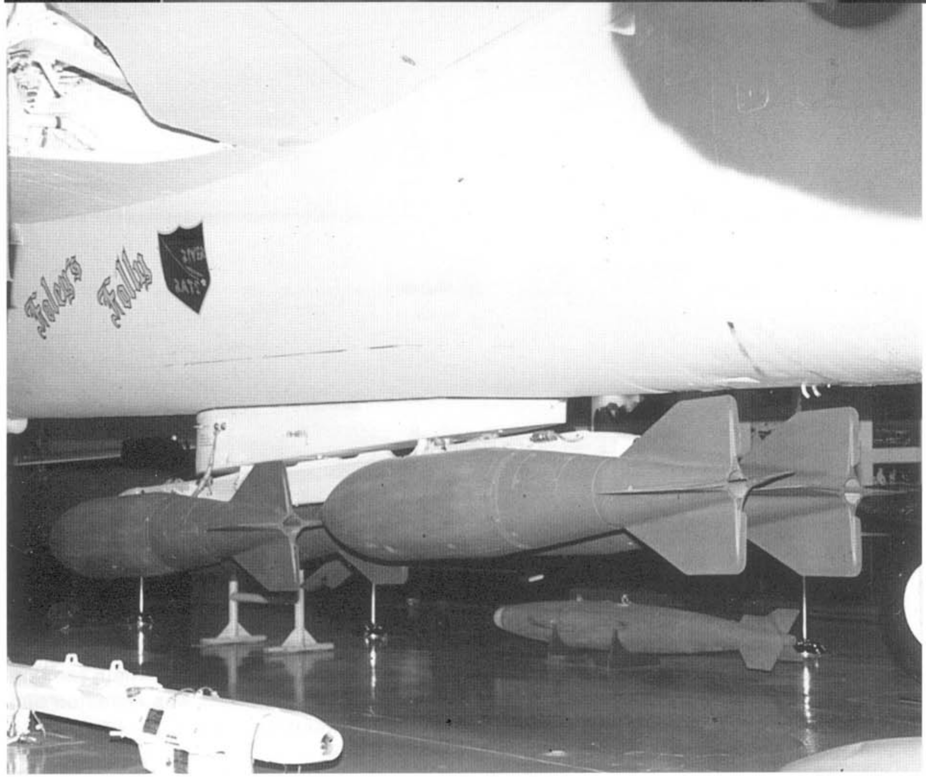

L/H QRC-160 POWER ØA
R/H QRC-160 POWER ØA
R/H QRC-160 POWER ØB
L/H QRC-160 POWER ØB
R/H QRC-160 POWER ØC
L/H QRC-160 POWER ØC
R/H QRC-160 POWER ØC
AI CKT BRK PANEL
68C40280

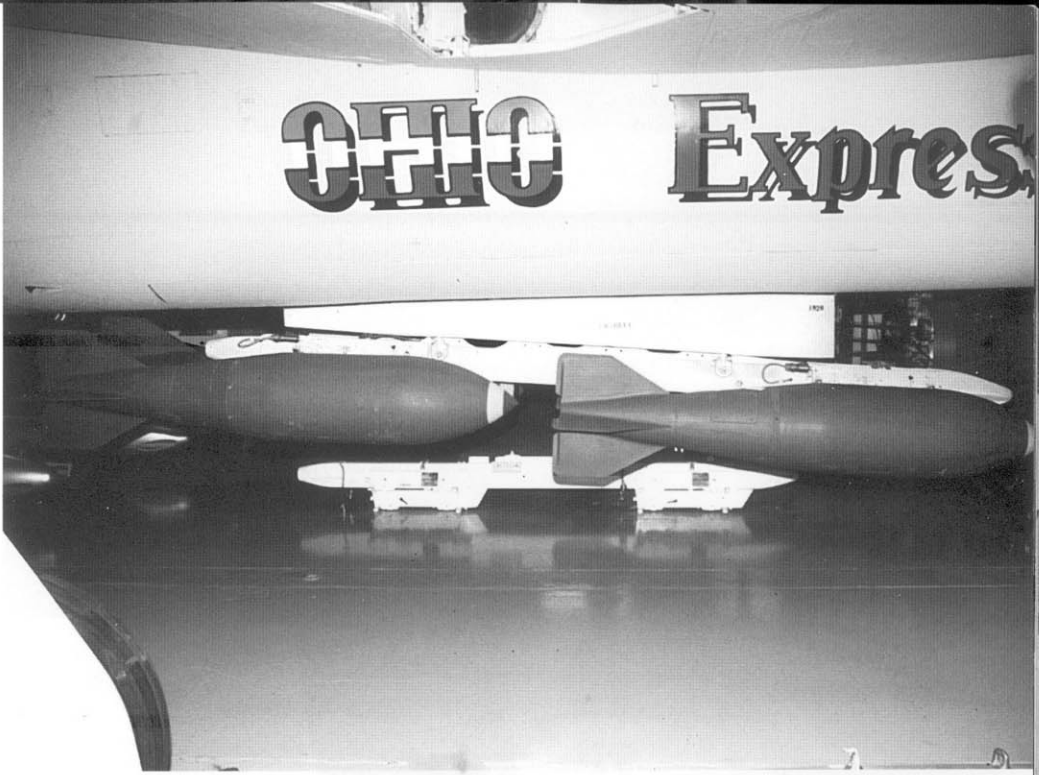

CAMERA DC
AIR REFUEL & BOMB BAY LTS DC
CONSOLE LTS FWD DC
FORMATION LTS DC
THERMAL SCREEN DC
FUEL LEVEL WARNING DC
AFT DC
POSITION LTS DC
DISPL GEAR & SHROUD COOLING DC
BOOSTER WARNING DC
RED FLOOD LTS FWD DC
SEAT ACTUATOR FWD & RAIN REMOVAL DC
LEFT QRC 160 POD POWER
RIGHT QRC 160 POD POWER
AFT DC
SEAT ACTUATOR AFT DC
LEFT QRC 160 POD CONTROL
ENGINE WATER INJECTION DC
THUNDER STORM LTS FWD DC
MISSILES
LI DC
RIGHT QRC 160 POD CONTROL
ENGINE PRESSURE RATIO ØA
AFT DC
LO DC
VENT SUIT BLOWER ØA
WIND SHIELD DE FOG ØA
NON FLIGHT INST LTS FWD ØB
RI DC
ØB
CABIN TEMP CONTROL ØA
AFT ØB
RO DC
ØC
MISSILE ØA
MISSILE ØB
MISSILE ØC

(Above Left) The blade antenna immediately aft of the F-105D's nose landing gear well was used for the aircraft's VHF (Very High Frequency) communications radio. The dark AN/ARW-73 missile guidance antenna was located aft of the VHF antenna, while the blade antenna further back fed command guidance to the AGM-12 Bullpup ASM. The F-105's radios were mounted under the cockpit floor. The vent above the VHF antenna was an electronics cooling air outlet. (Dennis R. Jenkins)

(Above) A secondary circuit breaker panel for some of the F-105's radios was installed in the starboard forward fuselage underside. These fuses backed up the primary circuit breakers placed in the cockpit. Holes along the circuit breaker panel were screw openings for fastening the access panel to the aircraft.

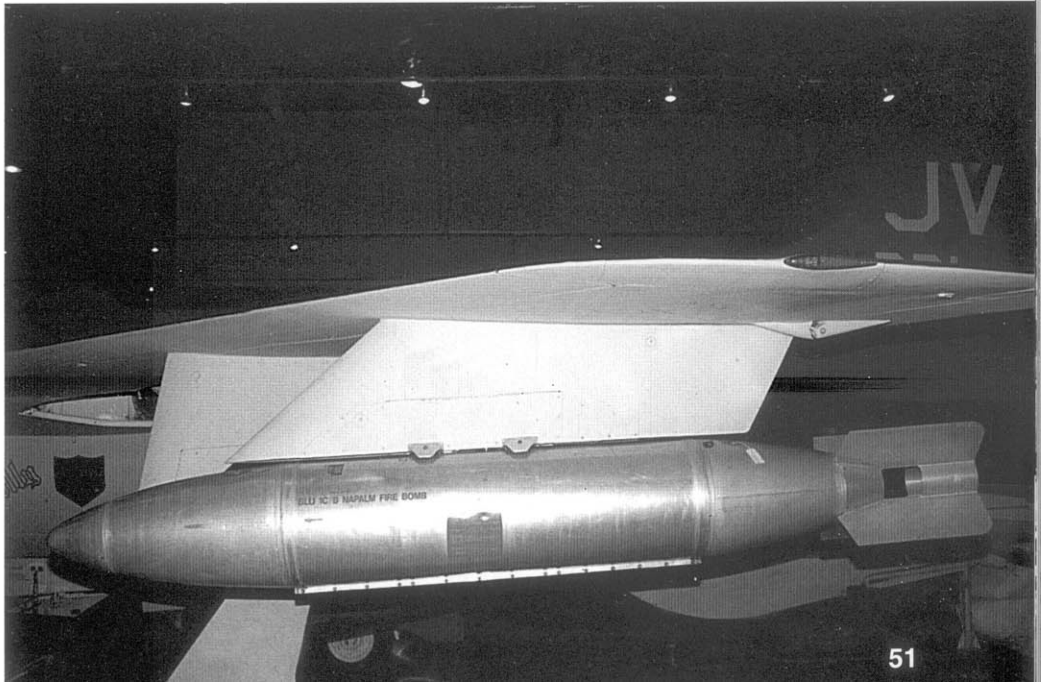
(Left) Another of the F-105's secondary circuit breaker panel was located in the port forward fuselage underside. Fuses installed in this panel backed up the primary circuit breakers placed in the cockpit for various electrical systems. The secondary panel contained circuit breakers for cockpit lighting and environmental control systems, engine accessories, and armament.



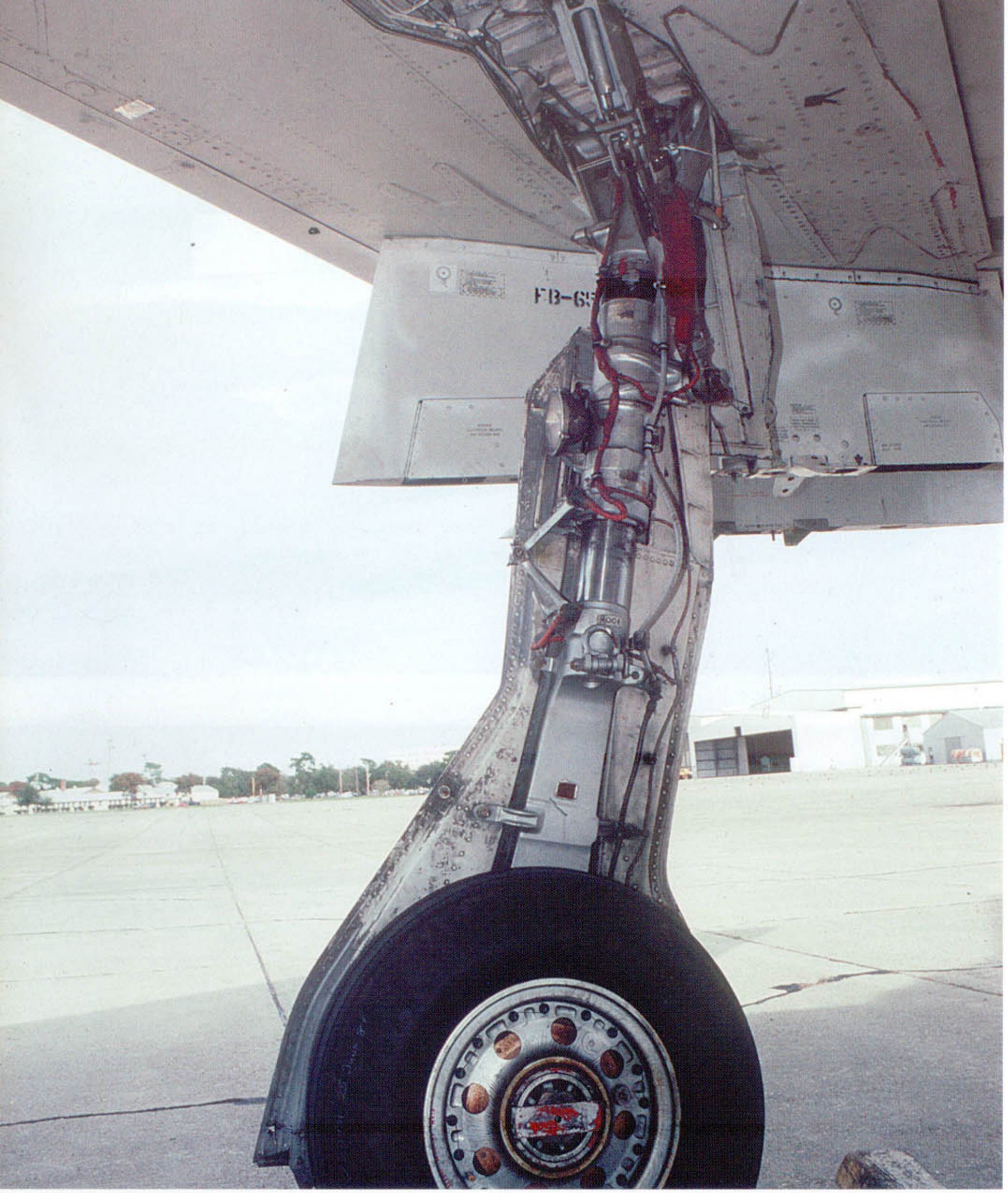


(Above) The centerline stores pylon was angled downward when the F-105D was on the ground. Bombs could be released from ejector racks either in salvo (all at once) or in sequence. The sequence release involved ejecting the lower bombs first, followed by the left and right side weapons; the rearmost bombs were usually released just before the weapons mounted ahead of them. A Multiple Ejector Rack (MER) is placed on the floor beside the F-105, while a 500 lb bomb is displayed starboard of the aircraft. The insignia painted after the name *Foley's Folly* on the F-105's fuselage is that of the River Rats, the members of the Red River Valley Fighter Pilots Association. The Association is comprised of F-105 pilots whose missions took them over the Red River in North Vietnam. (Dennis R. Jenkins)

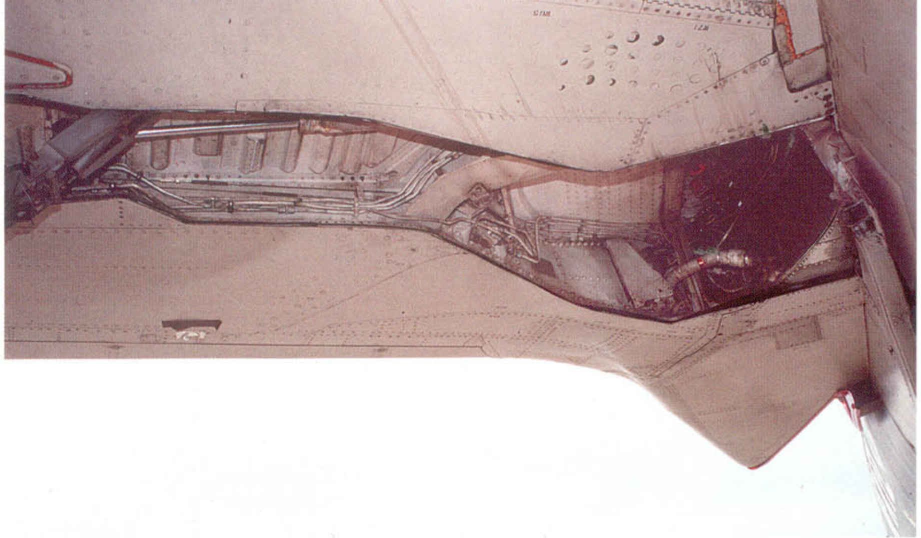
(Above Right) The F-105D OHIO Express (59-1771) is displayed at the Eglin Air Force Base Museum in Valparaiso, Florida with four 750 pound (337.5 kg) Mk 117 high explosive bombs mounted on the aircraft's centerline. The bombs are painted Olive Drab (FS34087) with yellow nose rings. The Thunderchief could carry up to 16 750 lb bombs using the centerline pylon and the four wing pylons. The bombs were attached to a Multiple Ejector Rack (MER), which was installed onto the centerline stores pylon. The pylon was attached to the closed bomb bay doors for carrying ordnance or fuel externally. (Dennis R. Jenkins)



A 720 pound (324 kg) BLU 1C/B napalm bomb is mounted to the port outboard wing pylon of this F-105D. The weapon is Natural Metal with red lettering and side panel. Napalm bombs were filled with fuel mixed with a jelling agent and fitted with an impact fuse. These incendiary weapons – also called fire bombs – were used for low-level ground attack missions against personnel and materiel caught in the open. Fuel Air Explosive (FAE) bombs began to replace napalm bombs during the Vietnam War. (Dennis R. Jenkins)

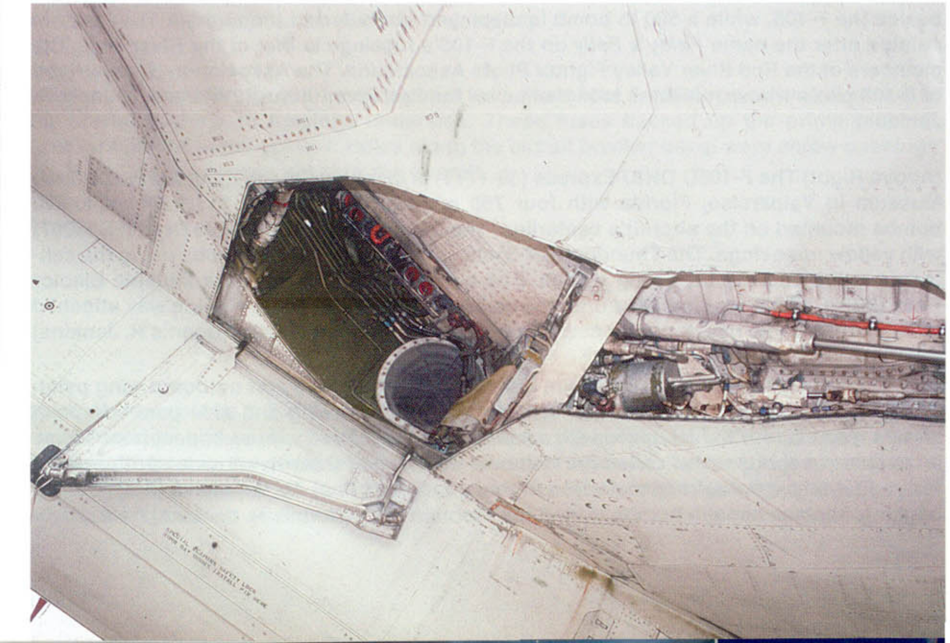


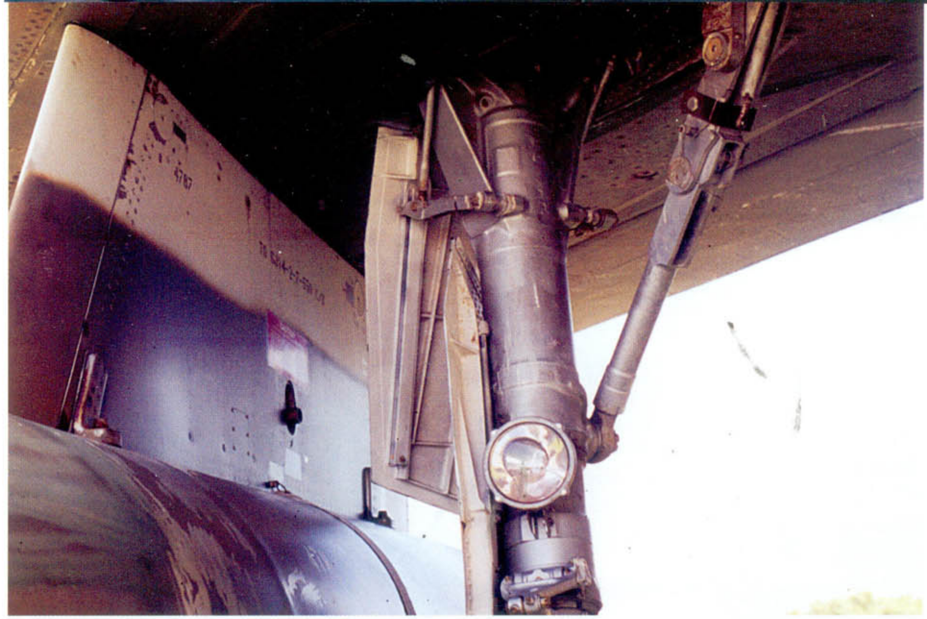
The F-105D's main landing gear was strengthened to support the Thunderchief's growing weight, although the inward retracting main landing gear retained its single wheel and tire. The leg torque scissor links were located at the front of the landing gear leg. These links expanded and contracted depending upon the weight placed on the lower gear leg section. Between the scissor links is the chrome plated oleo strut, which served as a shock absorber for the main landing gear. (Curtiss Knowles)



Various hydraulic lines servicing the landing gear and wing control surfaces ran along the port main landing gear bay's front wall. The chrome-plated strut was the main landing gear retraction strut ram. The ram compressed when the landing gear was retracted and expanded when the gear was extended. The inboard landing gear door closed over the wheel and tire. (Curtiss Knowles)

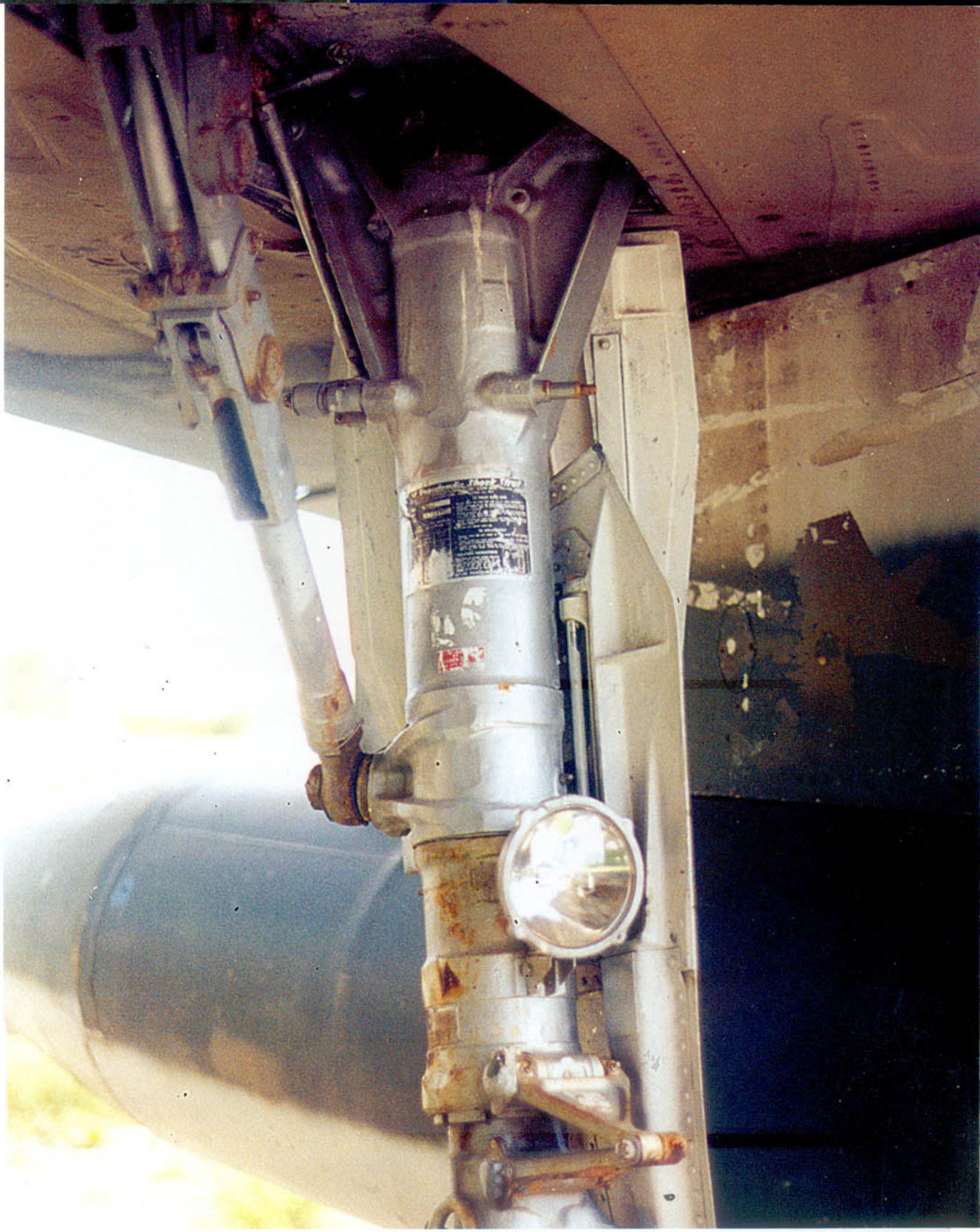
The circular secondary air intake was placed inside the port main landing gear well to bring additional air to the F-105's J75 engine while it was running on the ground. The primary hydraulic reservoir is the aluminum colored cylinder placed beside the diagonal wing spar. The main landing gear hydraulic retraction jack is next to the hydraulic reservoir. (Curtiss Knowles)



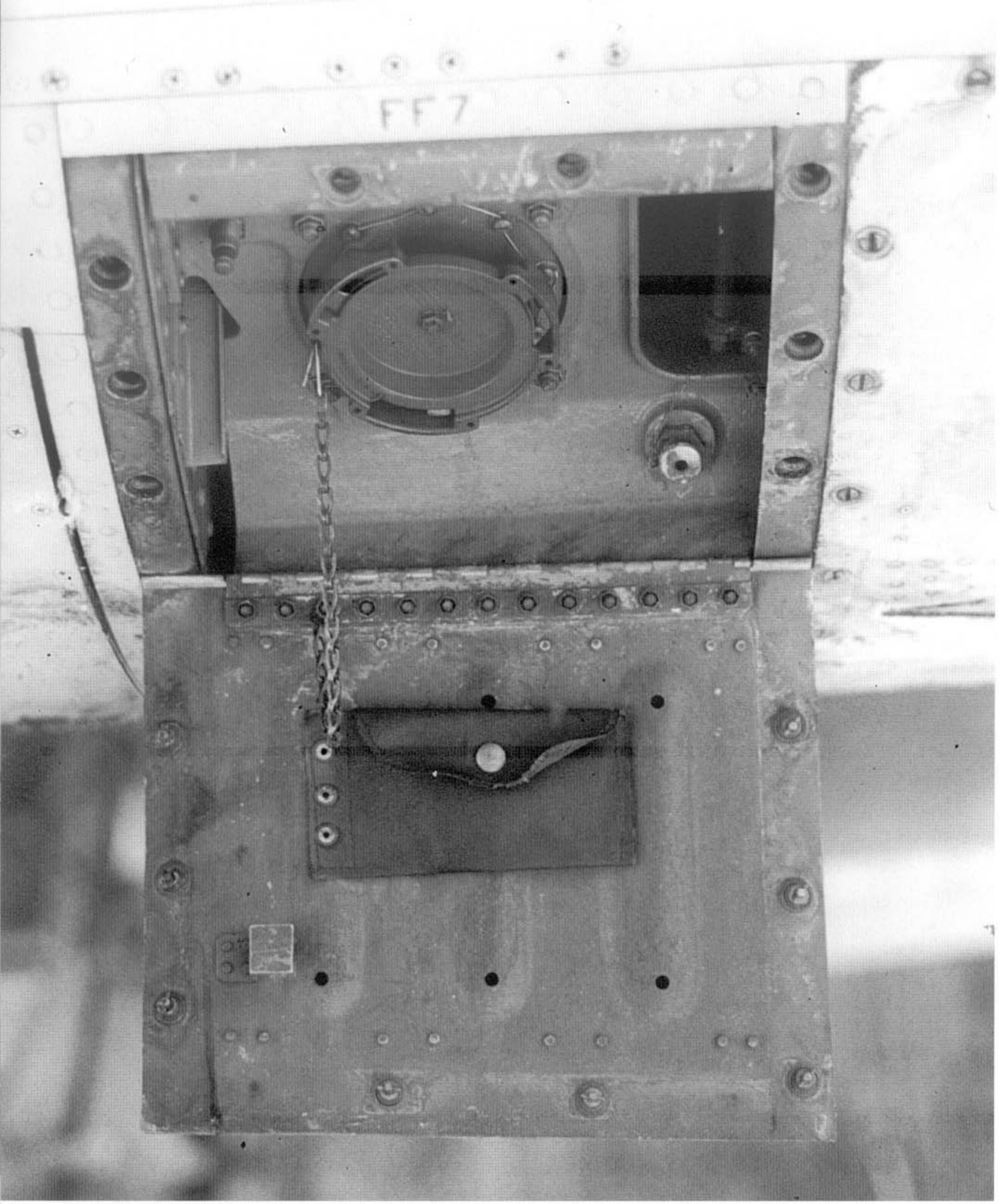


F-105D, F, and G models were equipped with stronger main landing gears over those used on the F-105B. The stronger gear allowed F-105s to handle their greater weight. The taxi lights, doors, and linkages remained in the same locations as with the F-105B. The gear struts were originally painted aluminum before repainting in gloss white, while the inside of the landing gear doors were gloss white. The inboard wing pylon and external fuel tank installation remained the same for all F-105 models.

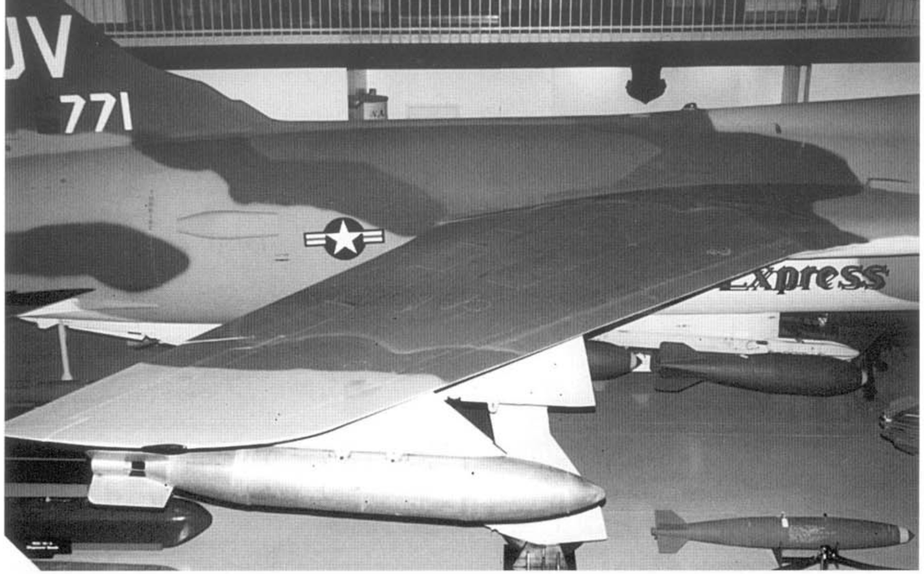
The 450 gallon (1701 L) external fuel tank is attached to the inboard wing pylon at two connection points. The connection points are located fore and aft on the lower surface of the pylon. Explosive bolts fitted to the two connections release the tank from the pylon upon the pilot's command. F-105s frequently carried two 450 gallon external fuel tanks to supplement the aircraft's internal fuel supply.



The retraction strut pulled the main landing gear strut into the wheel well and locked the main strut down upon extension. The light mounted on the main landing gear strut was lit during approach, landing, and taxiing. The scissor link connecting the upper and lower main strut extended when ground weight came off of the strut. The landing gear supported a maximum weight of 54,580 lbs (24,561 KG) in the F-105F and G models.

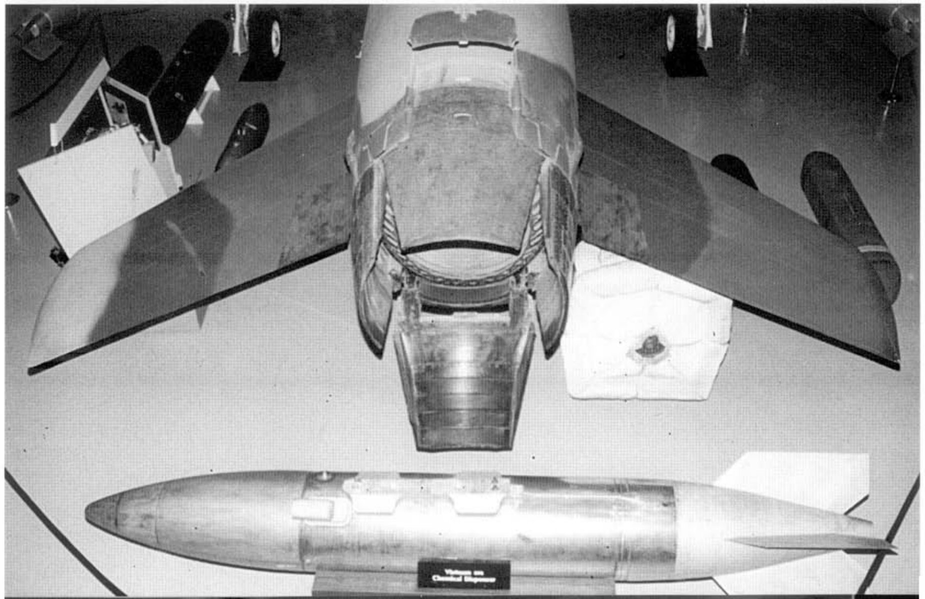


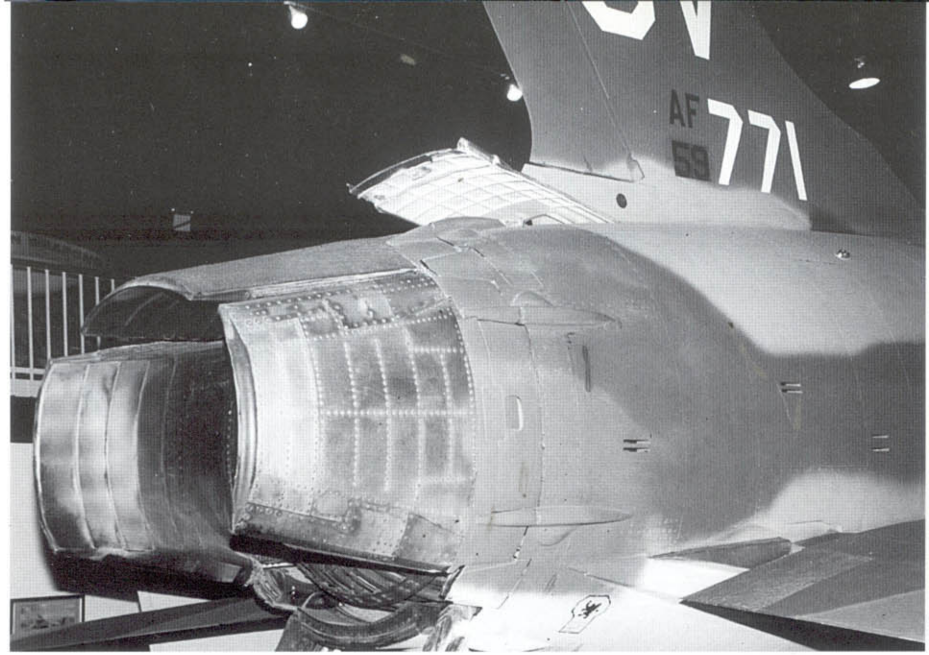
All F-105s were equipped with a single point ground refueling receptacle, which was placed on the port fuselage side aft of the bomb bay. A retaining chain is fastened to the red filler cap and the inside of the access door. The ground refueling access door opened downward and was secured with eight flush fitting screws. Three tanks within the F-105's fuselage held 1160 gallons (4408 L) of JP-4 fuel.



A BLU 1C/B napalm bomb is mounted on the right outboard wing pylon of this F-105D (59-1771). Napalm bombs – also called fire bombs – were produced in both finned and unfinned versions. The unfinned weapons tumbled and sometimes had a greater dispersion versus finned weapons, which had a predictable ballistic path. Displayed beside the Thunderchief are other ordnance used by the F-105, including a 500 pound Mk 82 bomb in front of the main landing gear. (Dennis R. Jenkins)

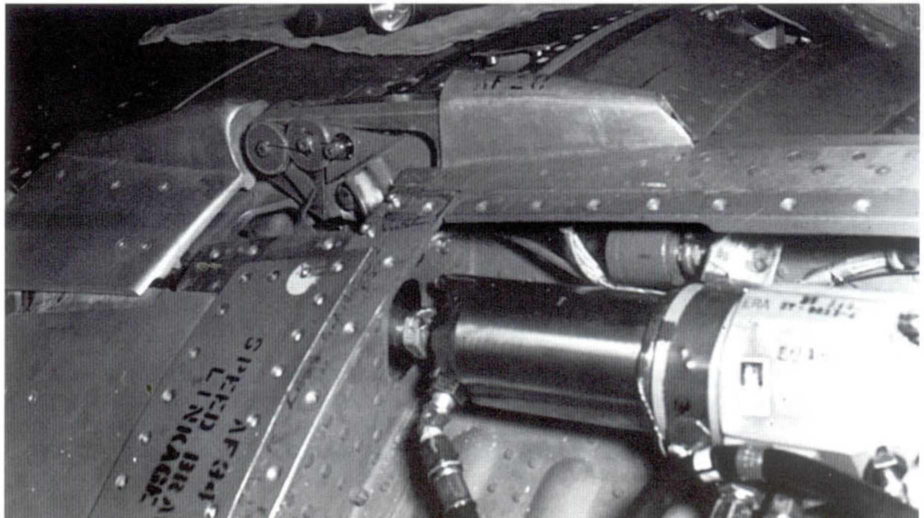
A napalm bomb – labeled a chemical dispenser by the museum – is displayed aft of a F-105D's tail and engine exhaust section. The weapon's tailfin section is believed to have been taken from another bomb. The F-105D's brake parachute door is open at the base of the vertical stabilizer, while the lower speed brake petal is in the usual down position for a Thunderchief on the ground. (Dennis R. Jenkins)

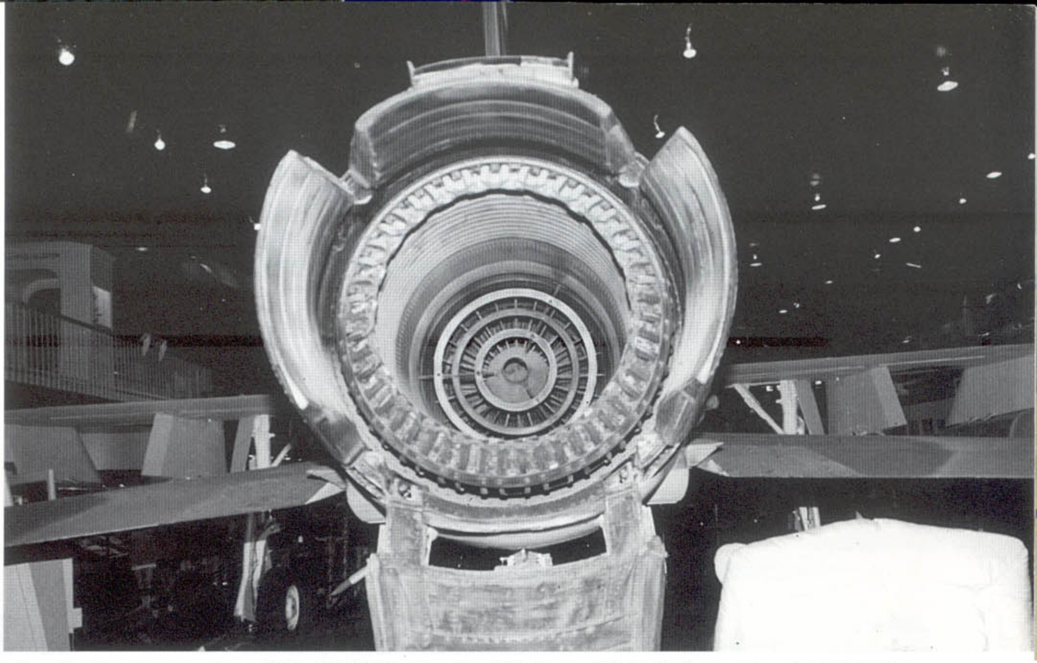




This F-105D's speed brake assembly has partially opened, with the lower petal dropped down. The stainless steel exhaust nozzle petals display the effects of engine exhaust heat, particularly on the inner surfaces. The open door forward of the engine exhaust is the brake parachute door. The door was spring loaded and had to be closed by ground crewmen. (Dennis R. Jenkins)

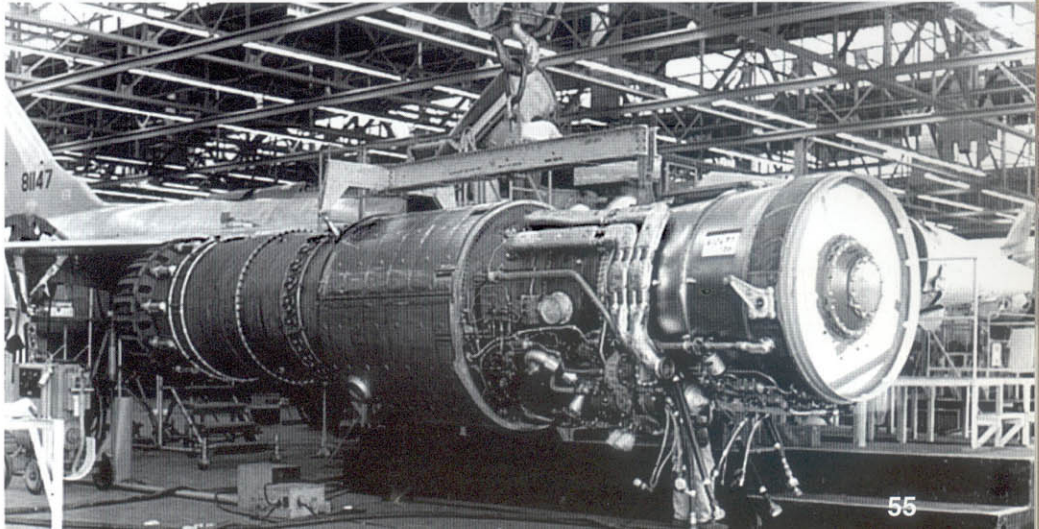
Access panels have been removed from this F-105's upper speed brake actuators. The opened panels exposed the upper hydraulic actuators used to control the starboard speed brakes and exhaust nozzle. Each petal had two actuators to raise the petal for slowing down the aircraft and to retract it to serve as nozzle controls. (Cradle of Aviation Museum)

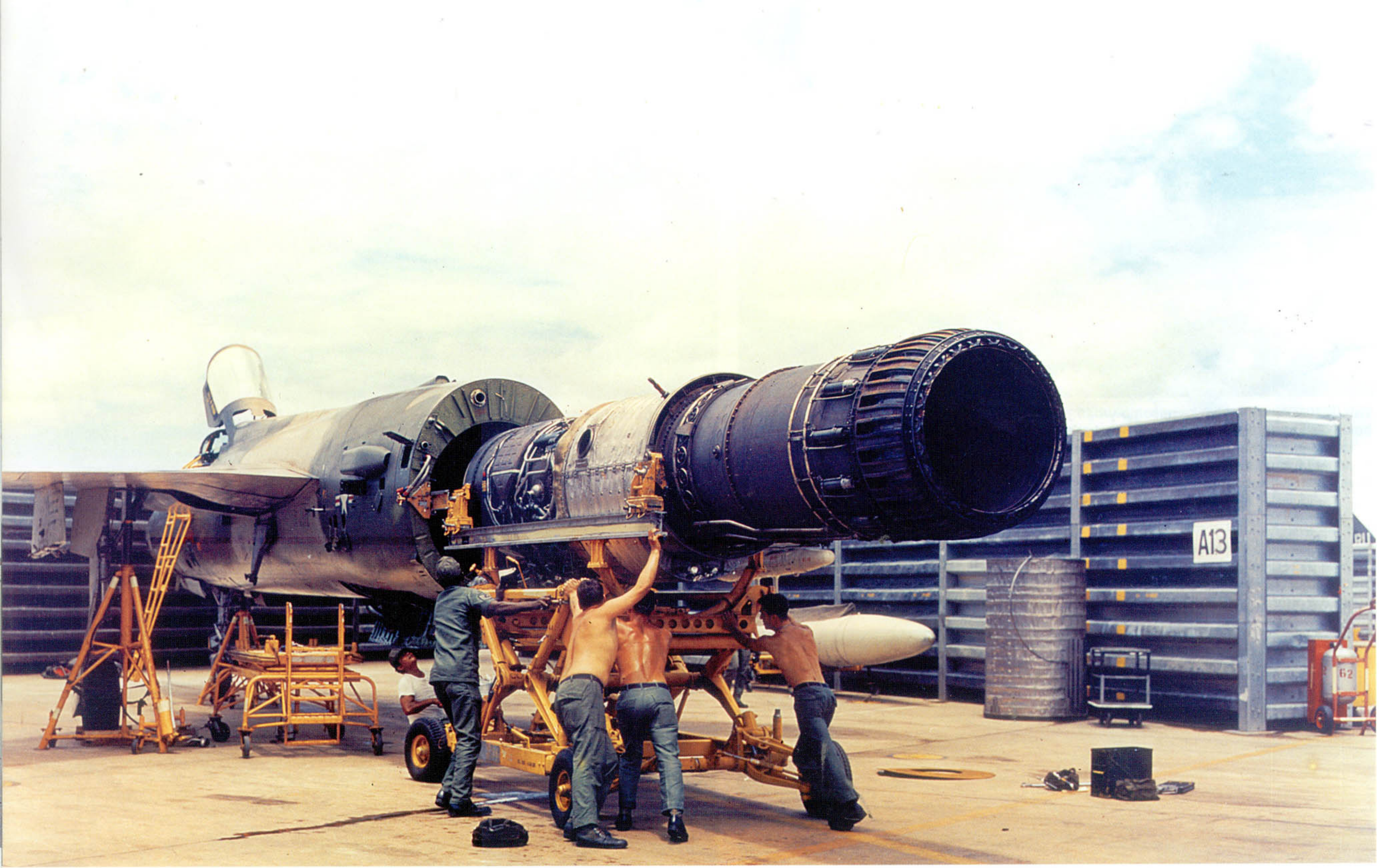




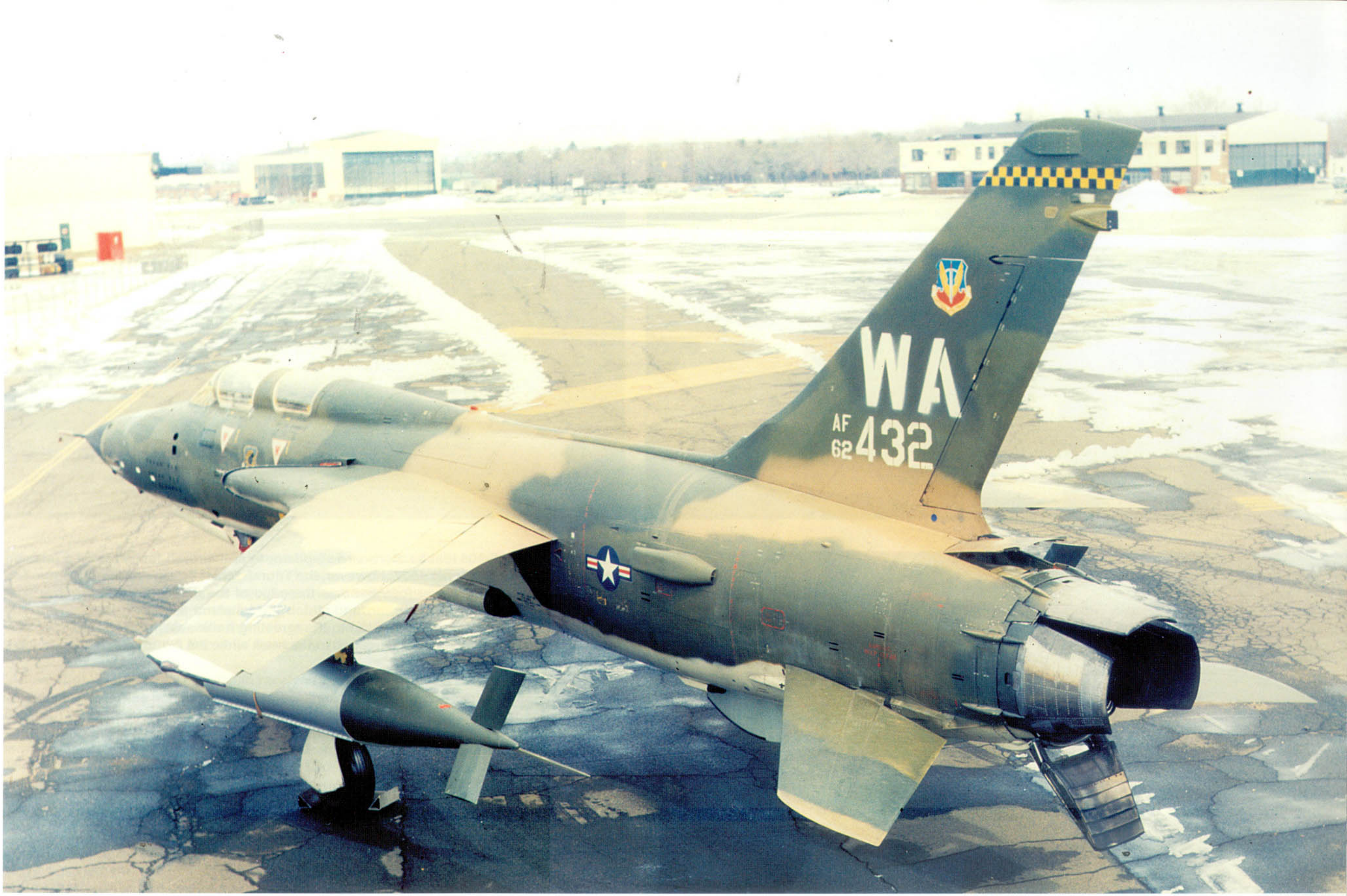
The afterburner section of the F-105D's Pratt & Whitney J75 turbojet engine includes the three concentric rings on which fuel is injected into the exhaust. The J75 generated 24,500 pounds (11,025 KG) of thrust in afterburner mode for up to 15 minutes. The lower speed brake surrounding the exhaust was normally lowered when the F-105 was on the ground, due to the lack of hydraulic pressure. (Dennis R. Jenkins)

A Pratt & Whitney J75-P-19W turbojet engine is slung from a hoist at the Republic factory in Farmingdale, Long Island prior to installation into an F-105D. This engine developed 26,500 pounds (11,925 KG) of thrust using maximum afterburner and water injection, burning fuel at a rate of 972 pounds (439 KG) per minute. The J75-P-19W was rated at 24,500 pounds (11,025 KG) in afterburner only and 16,100 pounds (7245 KG) in military (maximum non-afterburning) power. (Cradle of Aviation Museum)

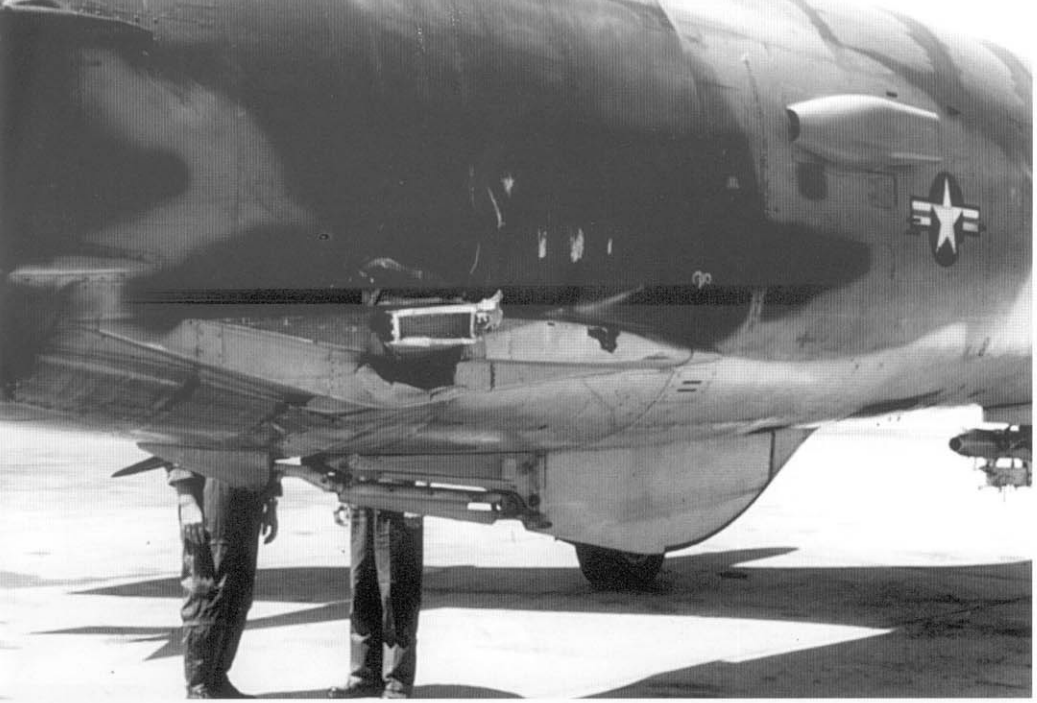


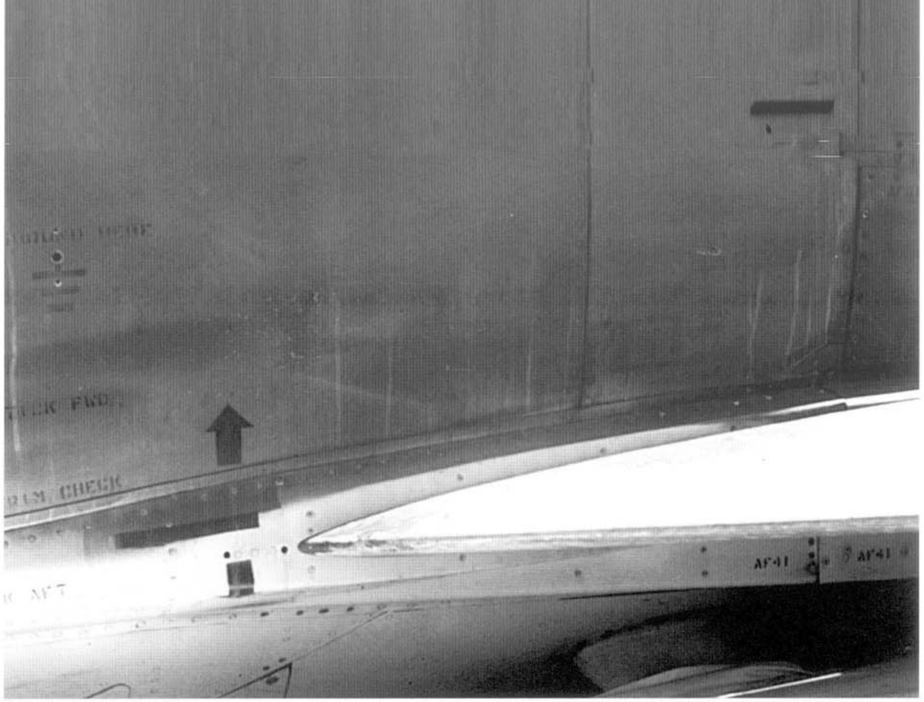


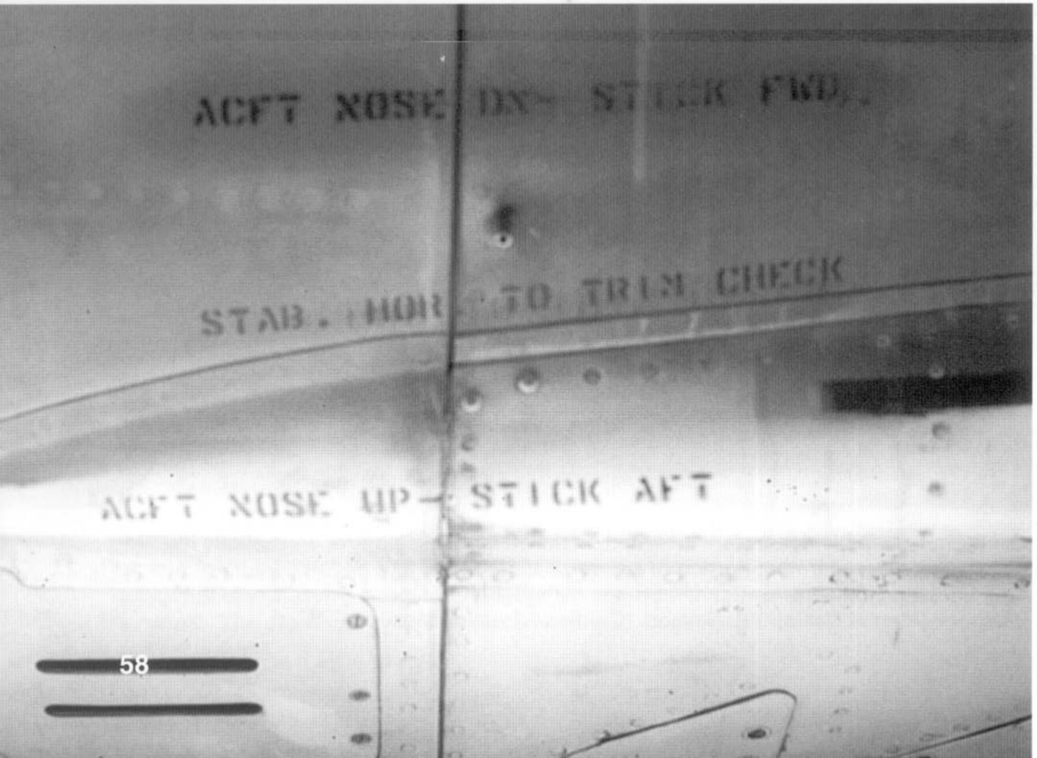
Ground crewmen load a Pratt & Whitney J75 engine that has undergone maintenance into an F-105D based in Vietnam in December of 1968. For any engine removal and replacement, the rear end of the fuselage and tail section of the aircraft was disconnected and removed. The J75 engine has five different stages, beginning with the low pressure and high pressure compressors at the front. The compressors are followed by the combustion chamber – the shiny portion of the engine – then the turbine stage. The afterburner combustion chamber is at the aft end of the engine. The J75-P-19W weighed 5950 pounds (2677.5 KG) without oil and fuel. (Cradle of Aviation Museum)



The first F-105G (62-432) is parked at Republic Airport in Farmingdale, New York in February of 1974. The lower speed brake droops down while the aircraft is on the ground and with hydraulic pressure off. The spring loaded brake parachute door is opened between the base of the tail and the forward edge of the speed brake. ECM (Electronic Countermeasures) antennas are mounted on the aft vertical stabilizer edge above the rudder and on the uppermost portion of the vertical stabilizer. The yellow and black checkered tail stripe indicates assignment to the 66th Fighter Weapons Squadron, 57th Fighter Weapons Wing at Nellis AFB, Nevada. (Cradle of Aviation Museum)



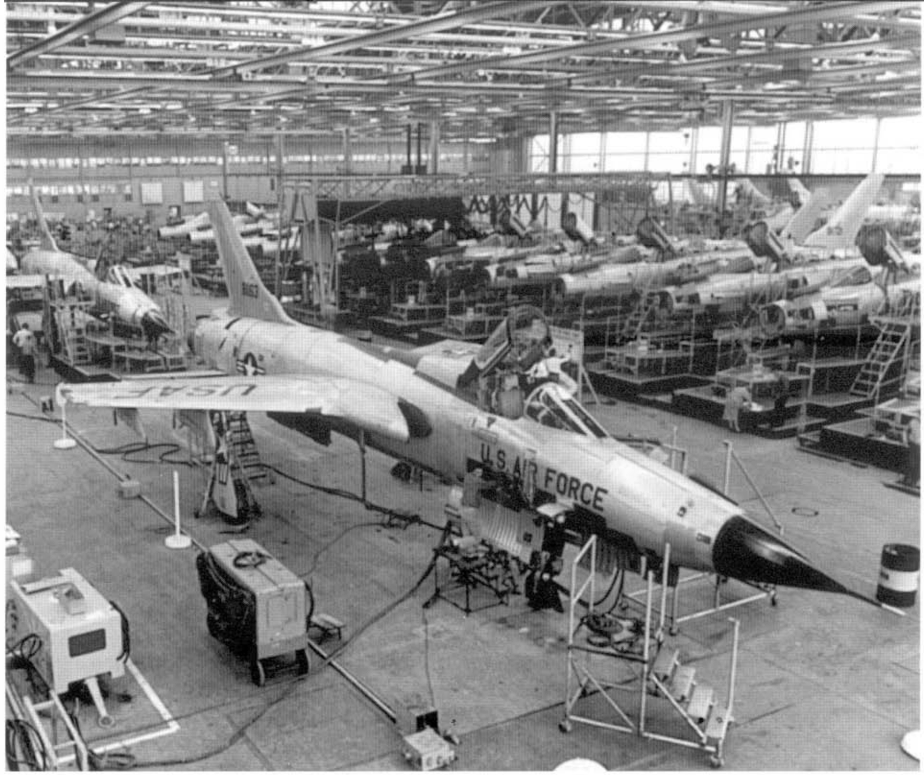


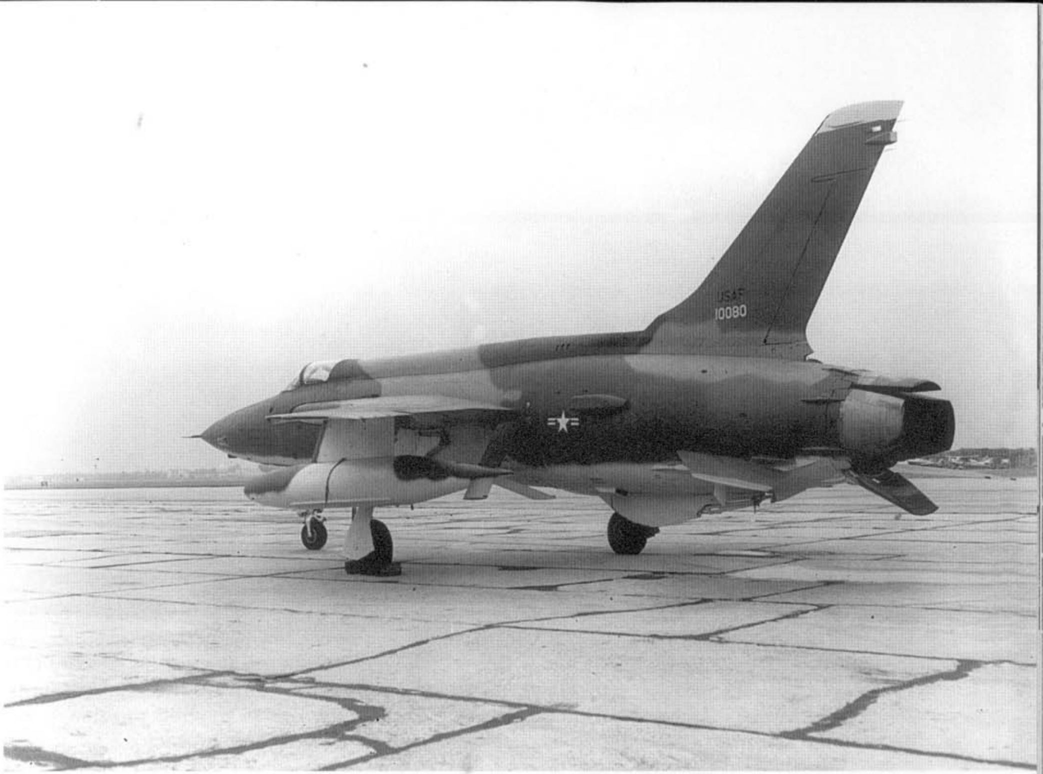


(Above Left) This F-105 lost its starboard stabilator to anti-aircraft fire while on a mission over Vietnam on 13 October 1967; however, the Thunderchief safely returned to base. The rectangular box on the lower fuselage was the edge of the tailplane box spar. The spar was attached to the pivot fixing, around which the tailplane moved up and down. The ground safety lock bracket is not fitted to the arresting hook assembly on the lower surface fairing. This lock prevented damaged to the hook while the F-105 was being serviced. (Cradle of Aviation Museum)

(Above) The port stabilator meets the aft fuselage at a fairing, which contains the stabilizer pivot and movement jack. The starboard horizontal stabilizer interface with the fuselage is identical. The F-105's all-moving horizontal stabilizers moved in unison to function as elevators, which controlled the aircraft's pitch (vertical movement).

(Left) The rear fuselage break point is located immediately in front of the stabilator base. This was the point where the tail and fuselage were separated to allow complete access and removal of the F-105's J75 engine. Black stenciling at the rear fuselage break point showed movement limits for adjusting the flight controls when removing the rear fuselage. The pair of cooling slots placed below the stabilator base allows air to escape from the engine afterburner section, reducing the risk of an engine fire.

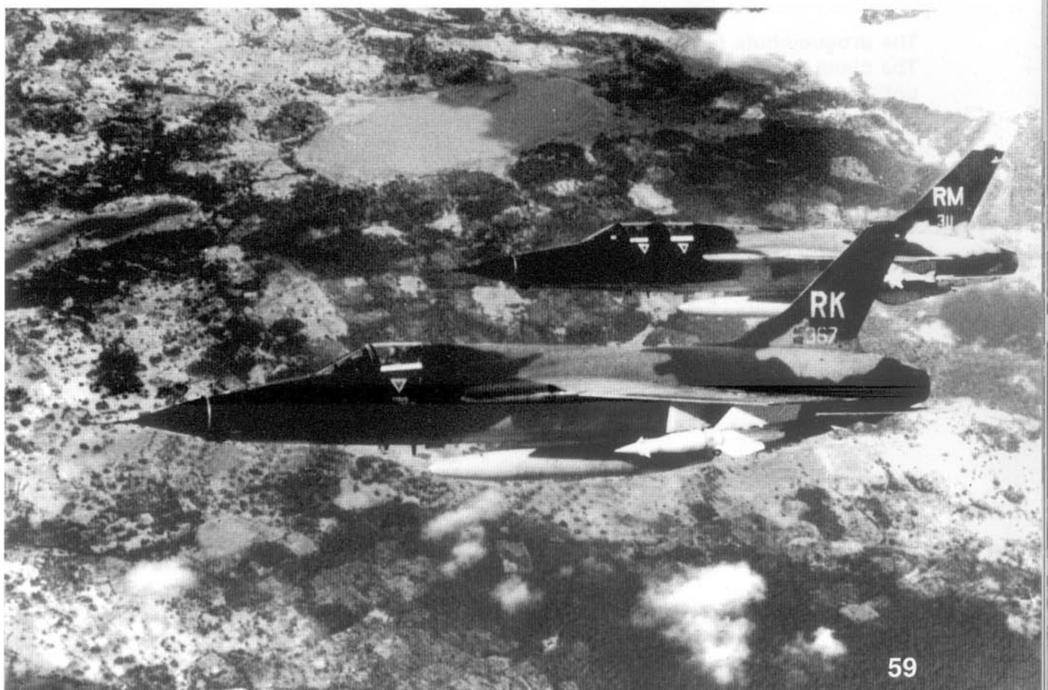


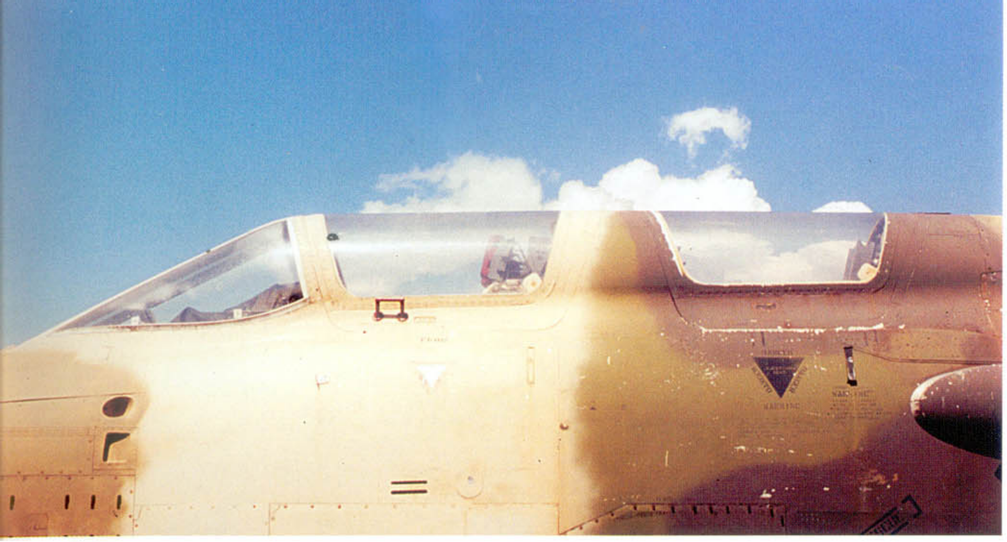


(Above) F-105Ds line up in the final assembly line – nicknamed 'Broadway' – at Republic's Farmingdale plant during the height of Thunderchief production in 1961. One Republic technician is installing avionics equipment in the starboard electronics bay under the cockpit. Several fuselages in the background are awaiting equipment installation before being sent on to be mated with their wings. Republic merged with Fairchild Hiller during 1961 to form the Fairchild Republic Company. (Cradle of Aviation Museum)

(Above Right) This F-105D (61-0080) received the Thunderstick II avionics modification in July of 1969. The modification resulted in the enlarged spine section located on top of the aircraft fuselage. The Thunderstick II system provided enhanced visual and blind (on instruments only) bombing capability to the aircraft. The additional avionics also allowed more precise navigation for the F-105. Fairchild Republic modified 30 F-105Ds to Thunderstick II standard from 1969 to 1971. No Thunderstick II F-105Ds saw combat service over Southeast Asia; instead, they served with the 23rd Tactical Fighter Wing at McConnell Air Force Base (AFB), Kansas. The aircraft later saw reserve duty with the 457th Tactical Fighter Squadron at Carswell AFB, Texas. (Cradle of Aviation Museum)

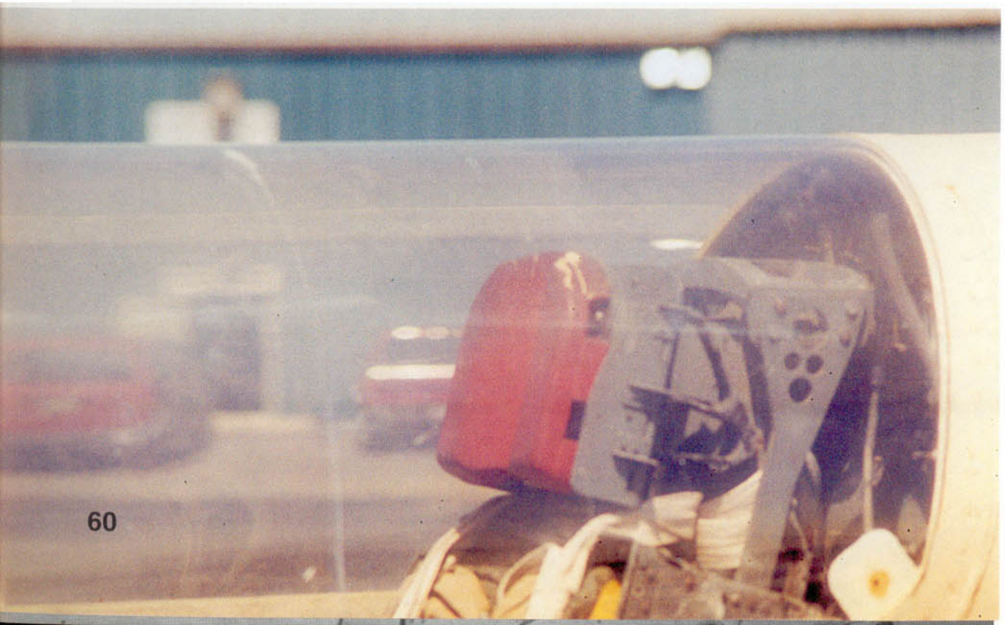
(Right) The single-seat F-105D would often be teamed with the F-105F two-seater during service in Vietnam. The F-105D (62-4367) in the foreground is carrying an AGM-12 Bullpup air-to-surface missile on the inboard port wing pylon for attacking high value targets. The F-105F (63-8311) carries an AGM-45 Shrike anti-radiation missile on the outboard port weapons pylon. The Thunderchiefs used the Shrike against enemy SAM (Surface to Air Missile) sites and the AGM-45 was designed to home in on the signals emitted by SAM guidance radars. The F-105s were assigned to the 355th Tactical Fighter Wing stationed at Takhli Royal Thai Air Base, Thailand. (Cradle of Aviation Museum)

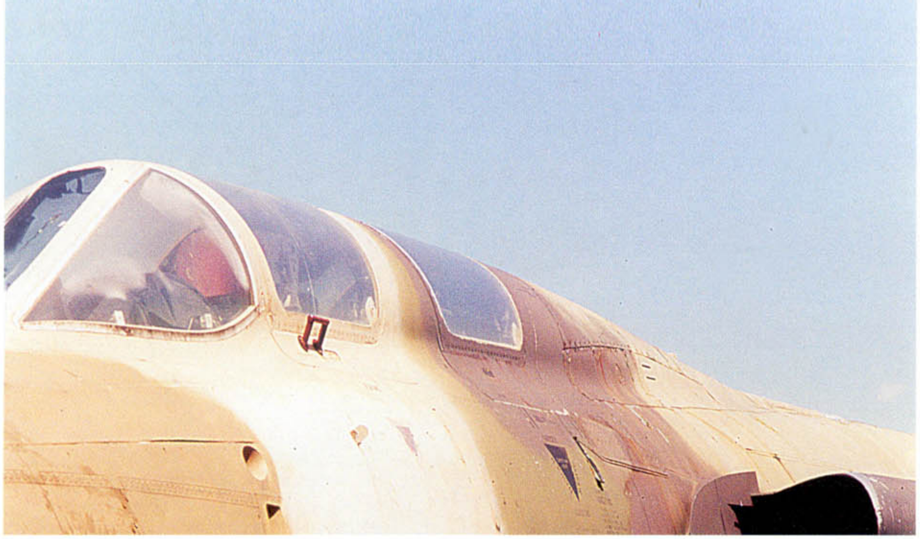




Both F-105G crewmen sat under separate aft-hinged canopies, with the pilot seated in front of the Electronic Warfare Officer (EWO). The red handle on the pilot's canopy is a museum addition to assist museum personnel in opening the canopy. The thin rectangular object on the canopy frame is the canopy lift latch, which is pushed to release the canopy for opening. EWOs were also called 'Bears' or 'GIBs' (Guys In Back).

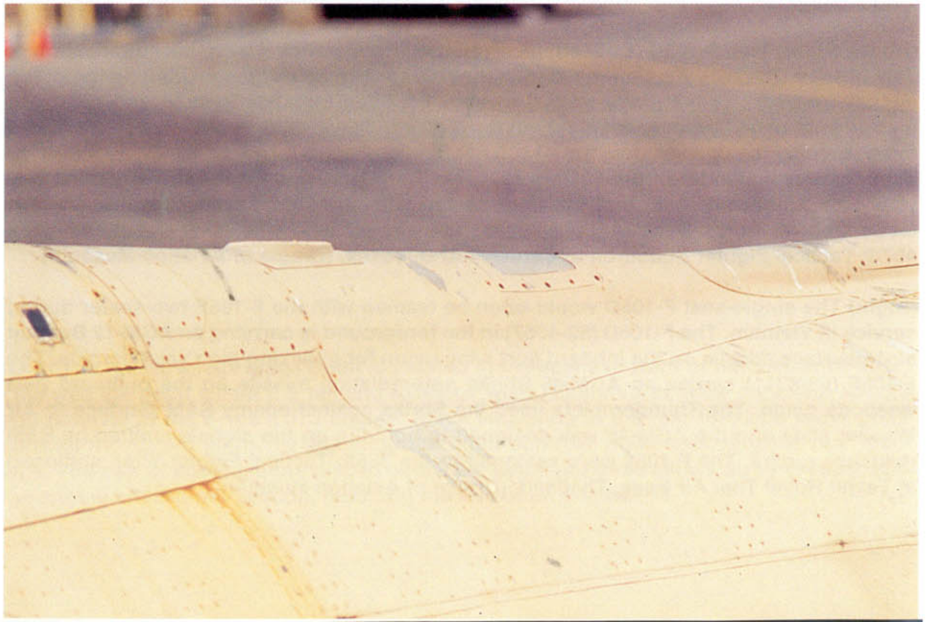
The drogue chute for the F-105's ejection seat was fitted behind the armored headrest. The chute deployed after the seat had fired from the aircraft and slowed the seat down until the pilot separated from the seat. The Thunderchief's ejection seat was rated safe for ejection at 85 knots (91.5 MPH/147.3 KMH) airspeed at zero altitude.

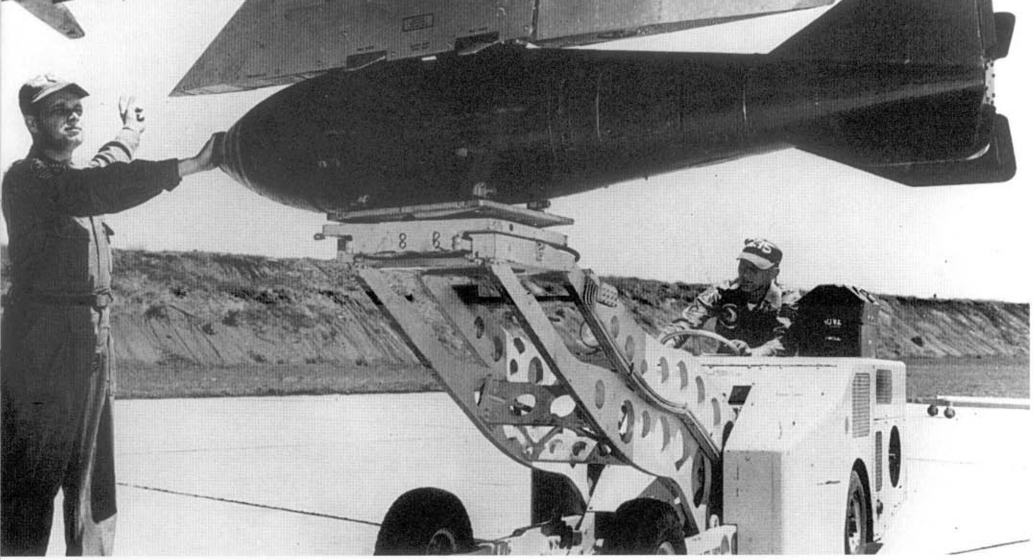




The F-105G's two canopies were both made from two layers of clear plastic and were hinged at the back. The canopies and quarterlights have fogged due to moisture in the cockpit. A fairing blended the aft canopy to the fuselage and housed the aft canopy actuator mechanism. Fairchild Republic converted 54 F-105Fs to F-105Gs 'Wild Weasels' during the early 1970s.

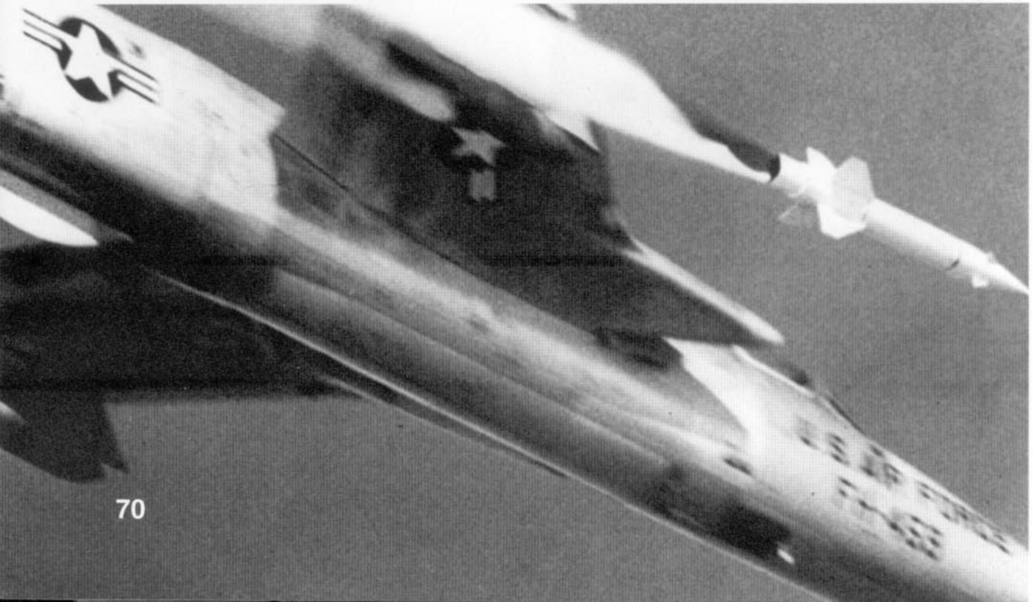
Access panels for the canopy hinge system and the AN/ARN-61 localizer antenna are located aft of the F-105G's rear cockpit. The localizer gives directional guidance to the aircraft's Instrument Landing System (ILS) for all-weather operations. Behind the AN/ARN-61 antenna is a formation light, followed by the beginning of the spine. The spine leads to the base of the Thunderchief's vertical stabilizer.

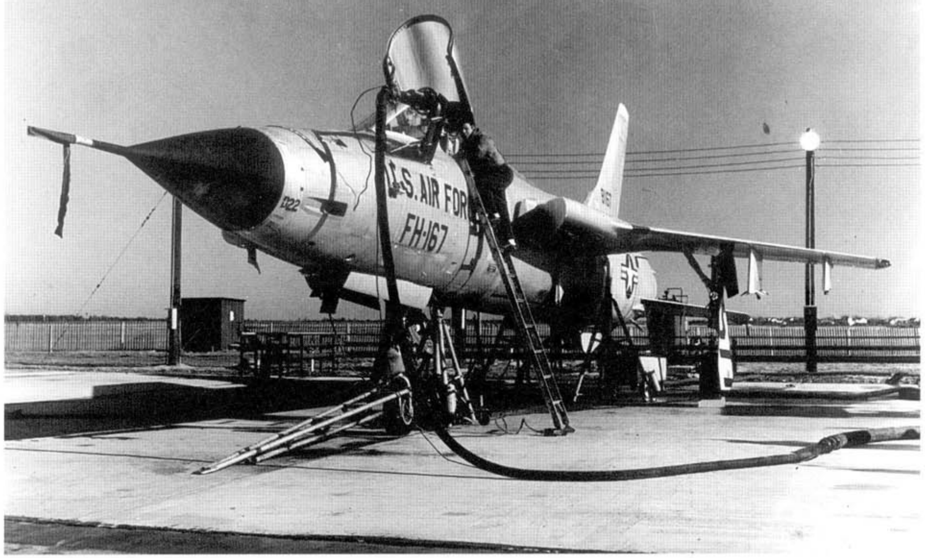




Ground crew load a 750 pound (337.5 KG) Mk 117 bomb to the starboard outboard wing station of an F-105B in July of 1959. One crewman uses an ordnance loading truck to raise the bomb to the pylon, while his colleague steadies the bomb into position. Live bombs were painted Olive Drab (FS34087) with yellow nose rings. (Cradle of Aviation Museum)

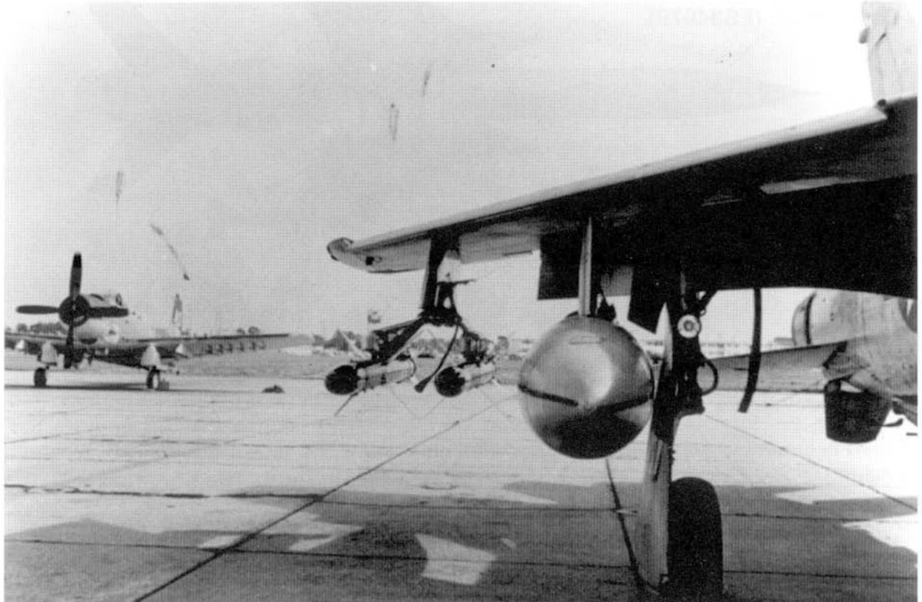
An F-105D fires a Martin/Maxon GAM-83A Bullpup air to surface missile from its inboard right wing pylon on 20 July 1961. The Bullpup – later redesignated AGM-12C – was guided by radio command link with the launching aircraft. The AGM-12C carried a 1000 lb (450 KG) high explosive warhead to a maximum range of 10.5 miles (17 KM). The missile was painted overall white. (Cradle of Aviation Museum)

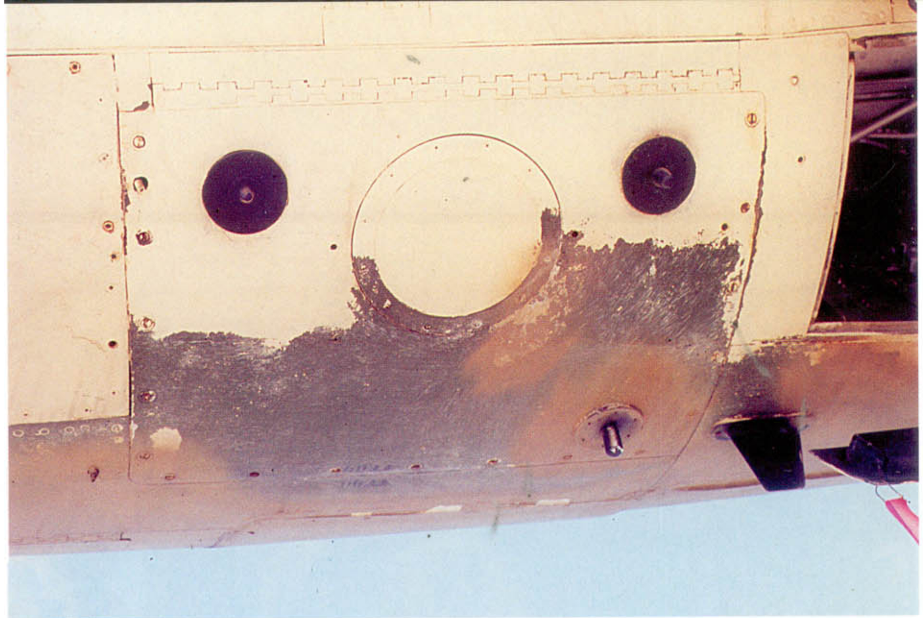




An F-105D (58-1167) receives fuel through its extended in-flight refueling probe on 5 February 1960. The fuel hose connected the probe with a fuel supply to the left of the aircraft. The last F-105Ds were built with both refueling probes and receptacles, while the other Thunderchiefs were retrofitted to carry both refueling systems. The F-105D was painted overall Aluminum Lacquer (FS17178). (Cradle of Aviation Museum)

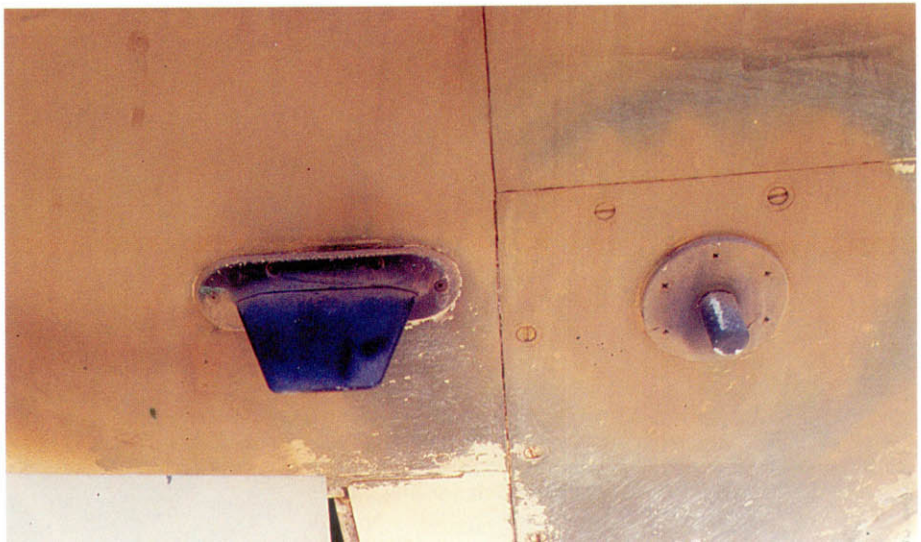
An F-105D was used to test a twin launcher for the Texas Instruments AGM-45 Shrike anti-radiation missile on 18 February 1964. The Shrikes were mounted on the outboard wing pylon with a 450 gallon fuel tank installed on the inboard pylon. Red REMOVE BEFORE FLIGHT tags are attached to the outboard pylon, the main landing gear retraction strut, and the fuel dump forward of the speed brake. A Douglas A-1 Skyraider is parked behind and to the right of the Thunderchief. (Cradle of Aviation Museum)

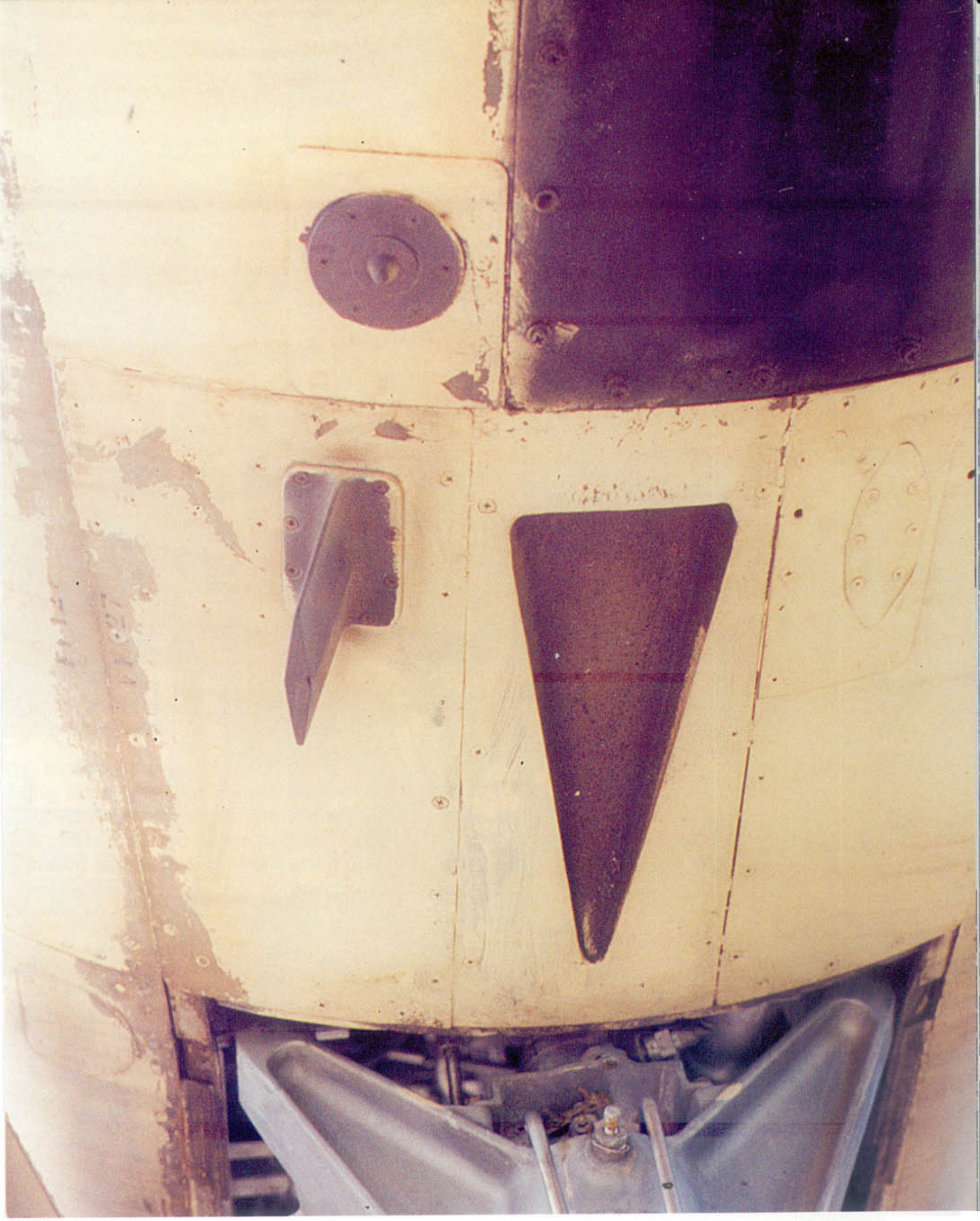




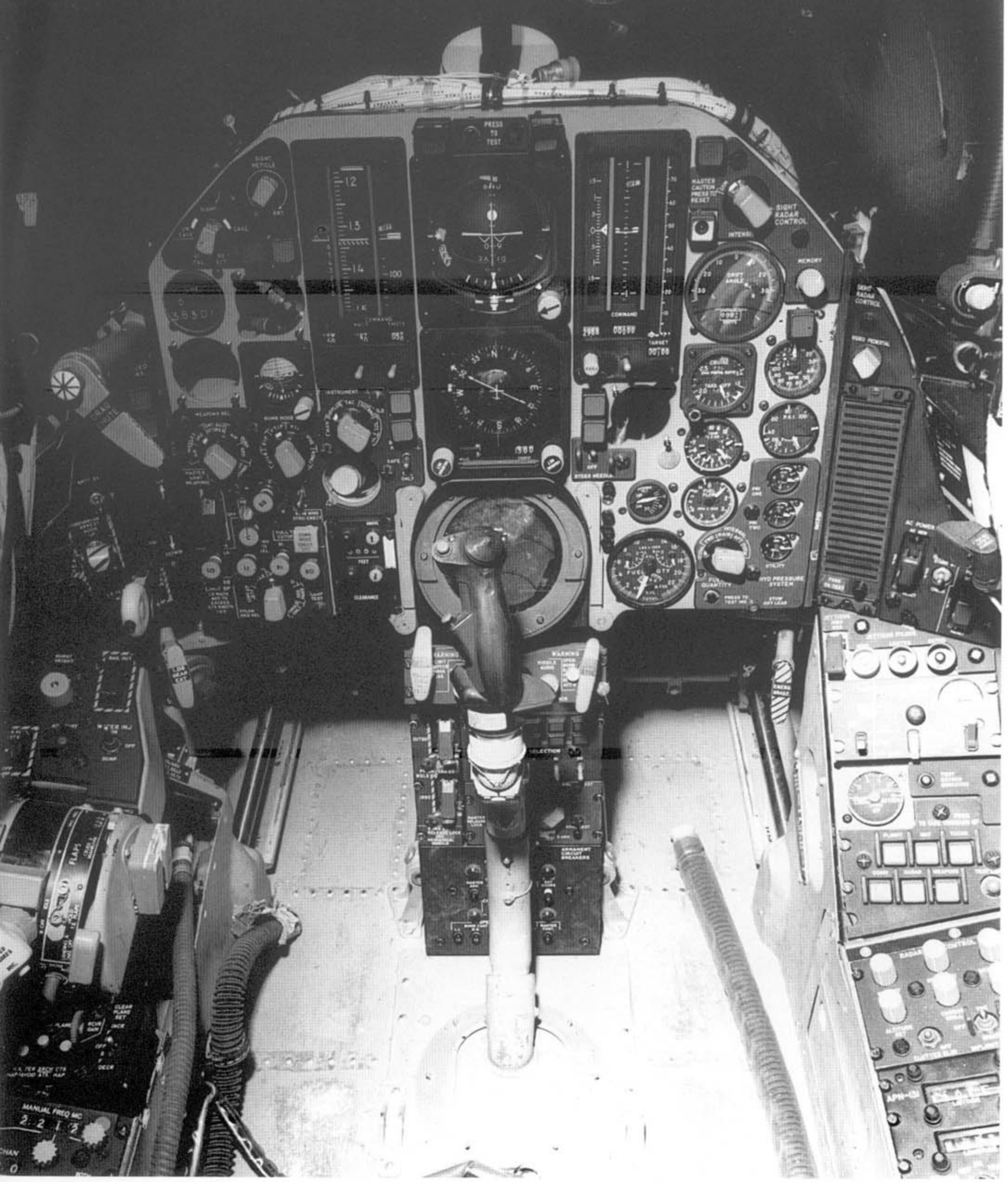
Several navigation system and electronic warfare antennas are mounted on the F-105G's forward fuselage undersurface. Three round black Itek AN/APR-35 RHAW (Radar Homing And Warning) antennas are placed near the circular AN/ARN-62 TACAN (TACtical Air Navigation) antenna. The RHAW antennas detected radar emissions to warn the F-105G's pilot and Electronic Warfare Officer (EWO). TACAN used radio signals from ground stations to confirm the aircraft's location and course. An AN/ALR-31 blade antenna is mounted forward of the RHAW and TACAN antennas.

The AN/ALR-31 was a C-band RHAW system which provided the EWO with warning of a SAM (Surface to Air Missile) launch. Two of the AN/APR-35 RHAW antennas are mounted on the forward edge of the undersurface avionics panel, behind the AN/ALR-31 blade antenna. This warning allowed the F-105G's crew to perform countermeasures, including launching Anti Radiation Missiles (ARMs) against the SAM site.

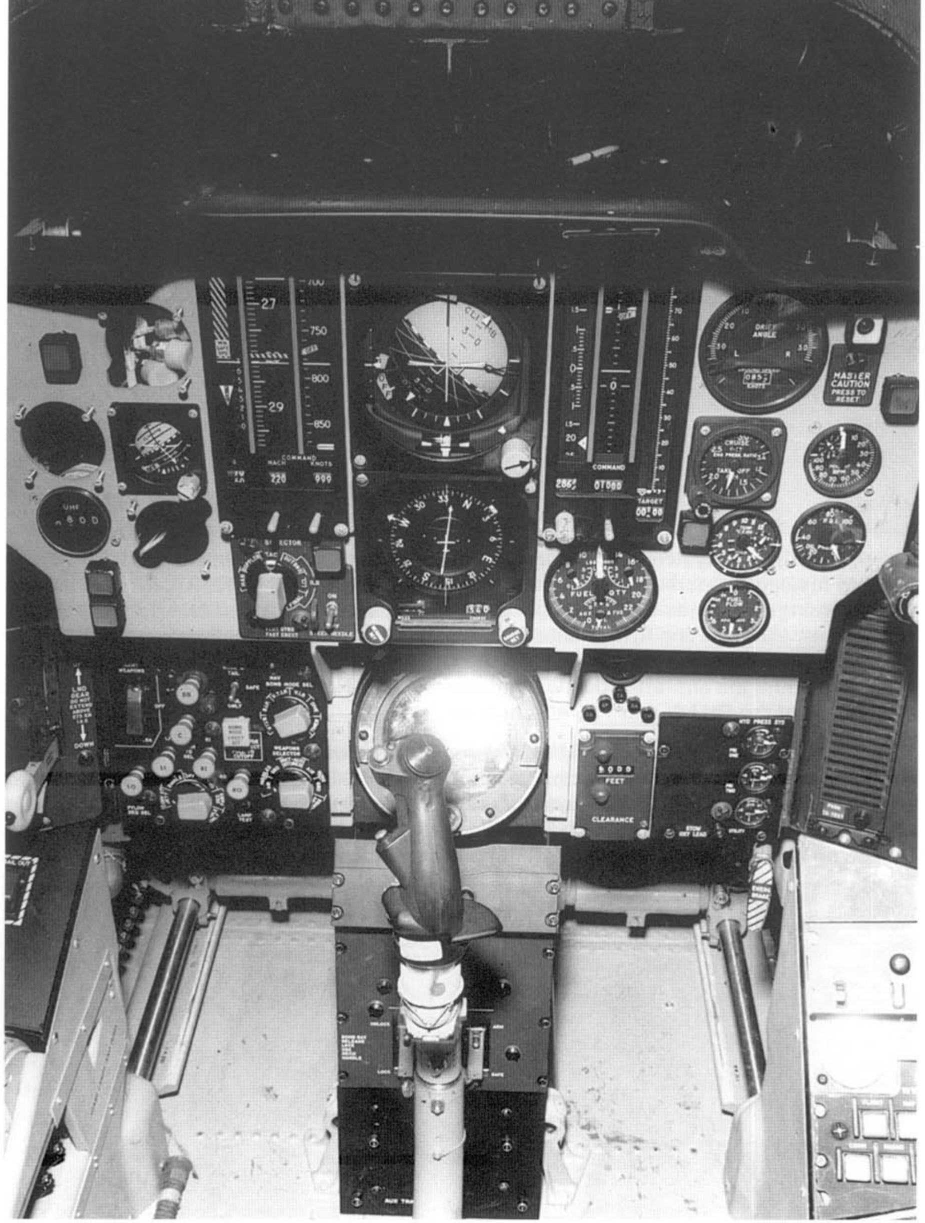




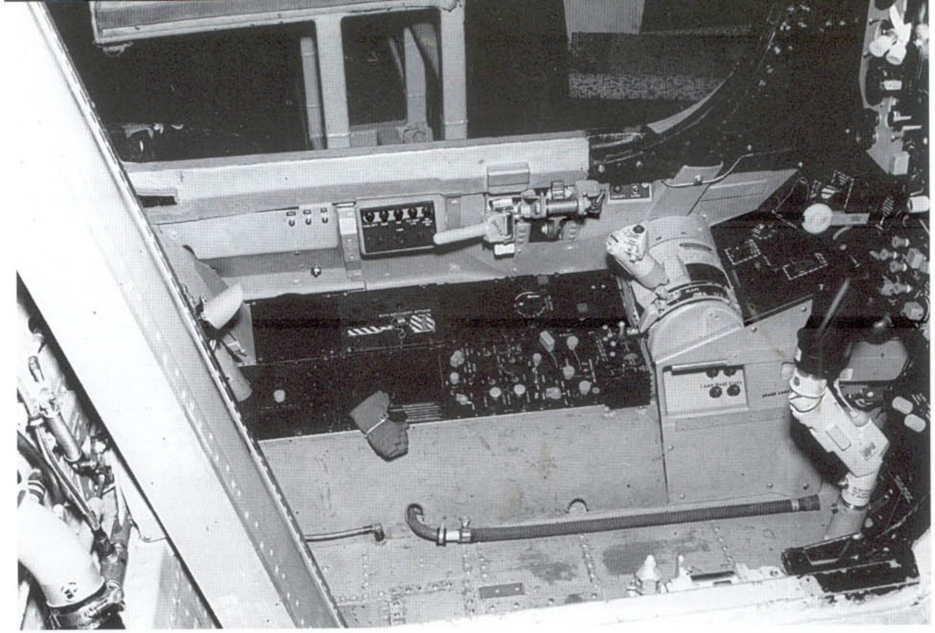
Immediately behind the F-105G's nose gear bay is a triangular AN/ARW-73 antenna. The AN/ARW-73 provided guidance for the GAM-83 (later AGM-12) Bullpup air to surface missile. The F-105G replaced the AN/ARW-73 with the APR-35/36 threat assessment system during the early 1970s. Next to the AN/ARW-73 antenna is a VHF (Very High Frequency) radio antenna for communications use. One of the AN/APR-35 RHAW antennas for detecting radar emissions is placed aft of the VHF antenna.



The F-105F front instrument panel used the same instruments and indicators as the F-105D's instrument panel. The Attitude Director Indicator (ADI) placed at the top center of the instrument panel provides the pilot with aircraft attitude information, including rates of climb and slip and glide slope displacement for instrument landing approaches. The Horizontal Situation Indicator (HSI) below the ADI displays navigation and attack positioning information for the pilot. (Cradle of Aviation Museum)

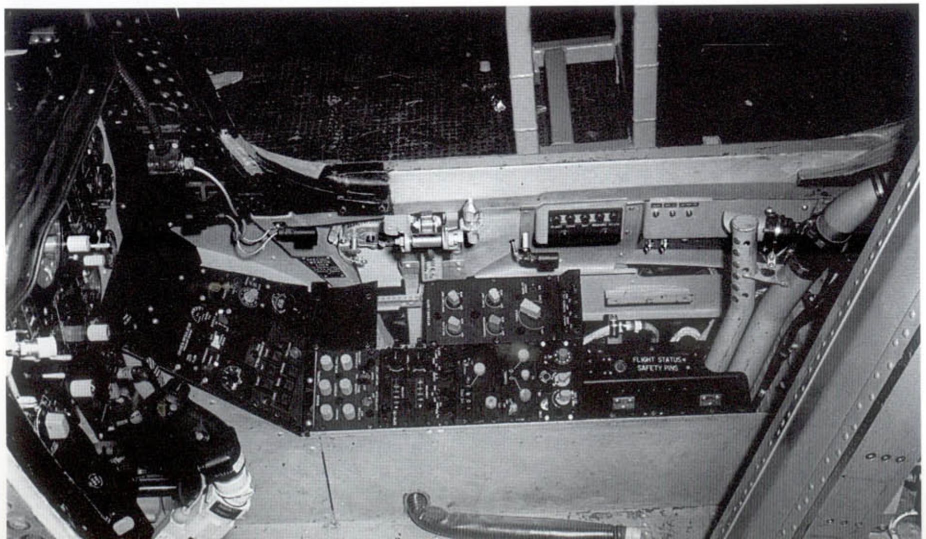


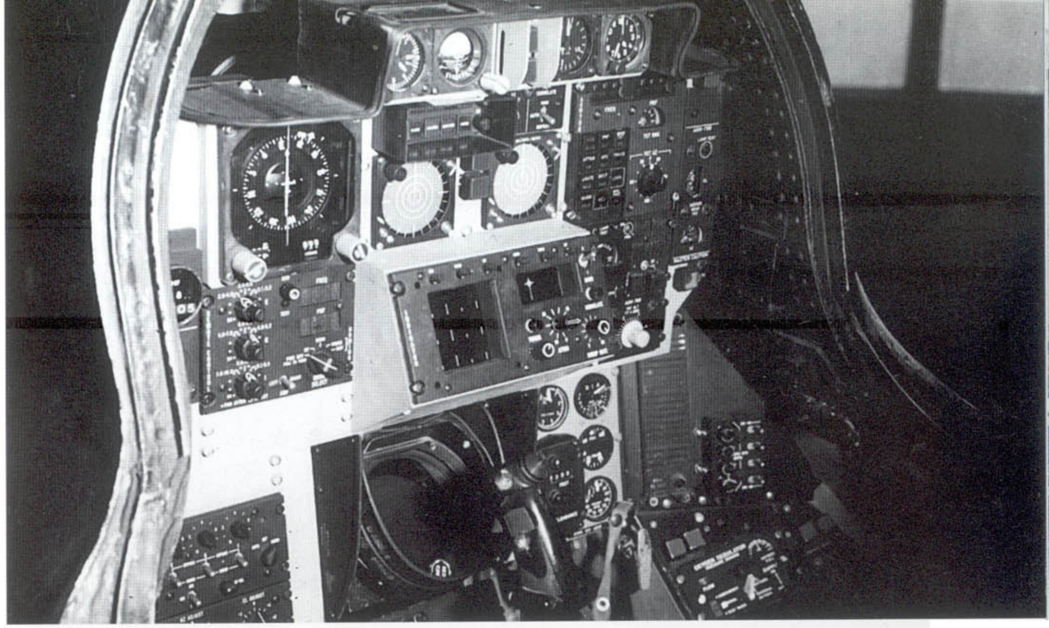
The F-105F's aft cockpit instrument panel is simpler than the front cockpit instrument panel. The aft instrument panel contains fewer flight gauges and indicators. The aft crewman – Electronic Warfare Officer (EWO) on Wild Weasel F-105Fs – was preoccupied with threat detection and neutralization. The F-105F rear cockpit includes standard flight instruments with control stick and throttle to allow the EWO to fly the Thunderchief in the event of pilot incapacitation. (Cradle of Aviation Museum)



The F-105F's rear cockpit port console is relatively uncluttered compared to the front cockpit's port panel. The blank area aft of the main bank of knobs did not have the Automatic Flight Control System (AFCS) panel of F-105Ds and Fs. The toss bomb controls are not fitted to the inboard side of the throttle quadrant. The rear crew member's G-suit hose lies on the cockpit floor beside the console. (Cradle of Aviation Museum)

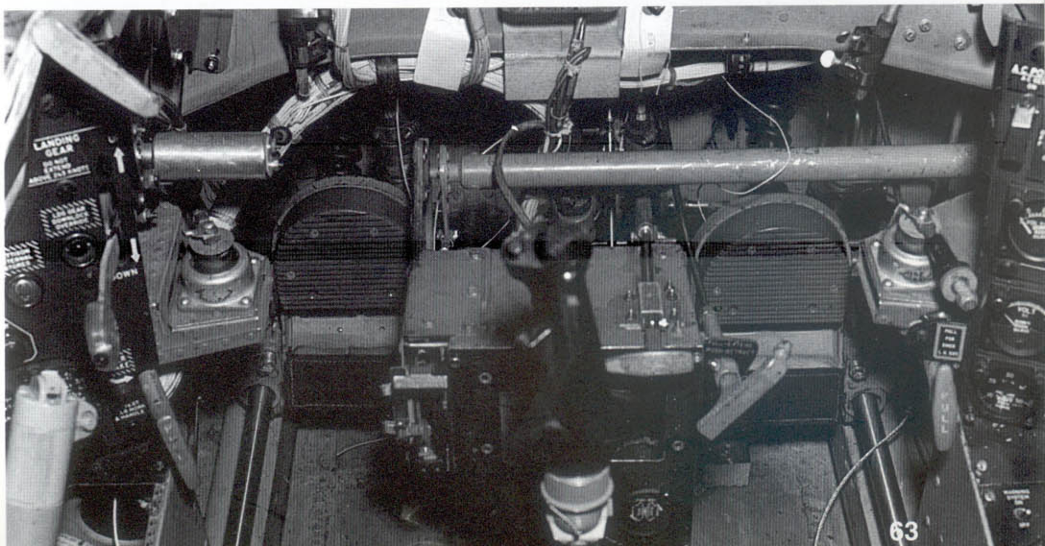
Controls for the F-105F's various lights and radios are fitted to the rear cockpit's starboard console. The open panel beside the cockpit wall held the cockpit utility light, which was used to illuminate the cockpit and maps at night. The rails rising from the cockpit floor were used to install the ejection seat into the aircraft. The oxygen hose for the rear crewman lies beside the console. (Cradle of Aviation Museum)

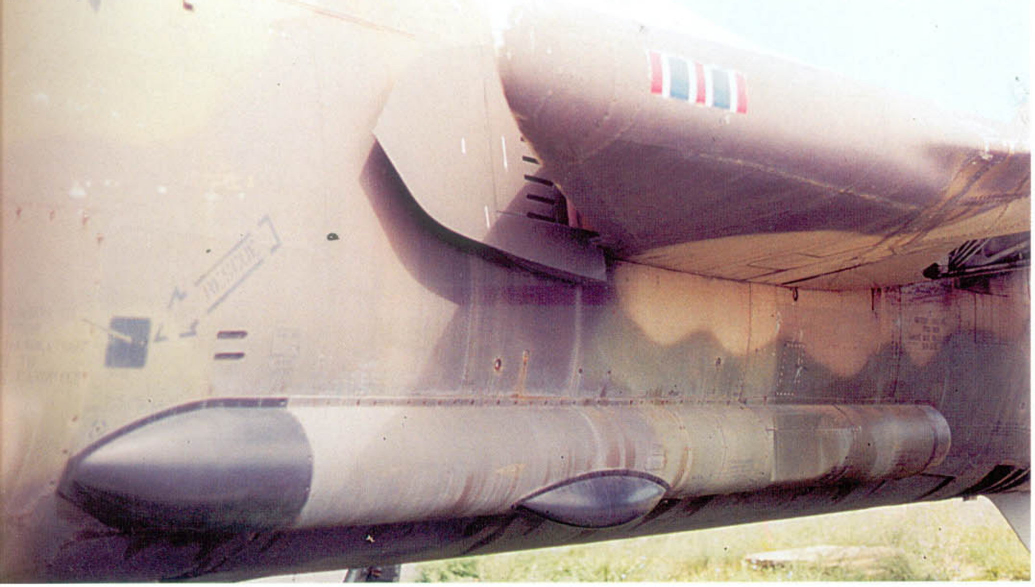




The rear cockpit main instrument panel of the F-105G is dominated by electronic warfare equipment used to detect and counter enemy radar transmissions. Two APR-25/26 RHAW (Radar Homing And Warning) scopes are mounted in the upper center of the instrument panel; these warned the EWO of radar transmissions directed towards the Wild Weasel. Below the strobe scopes is the ER-142 scan receiver, which provided the EWO with radar signal direction.

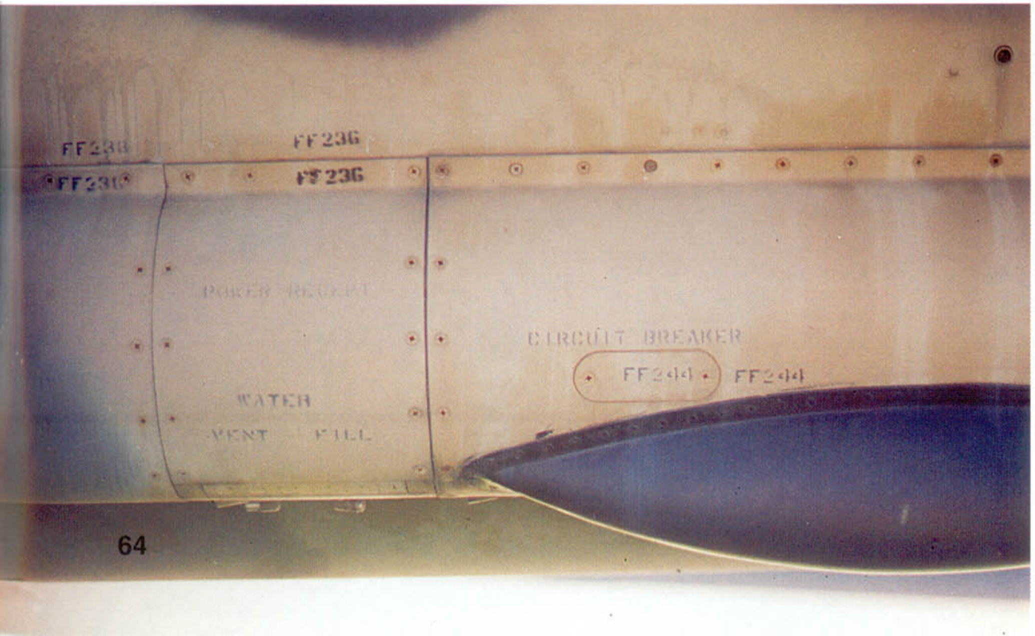
The main instrument panel has been removed from an F-105 to reveal the rudder pedals riding on a steel bar alongside the cockpit floor. The rudder pedals are equipped with grooved rubber pads on the top section for easy gripping by the pilot's soles. Leather material is attached to the pedals' bottom section to provide a heel rest. The control stick is placed on the cockpit floor aft of the rudder pedals. (Cradle of Aviation Museum)

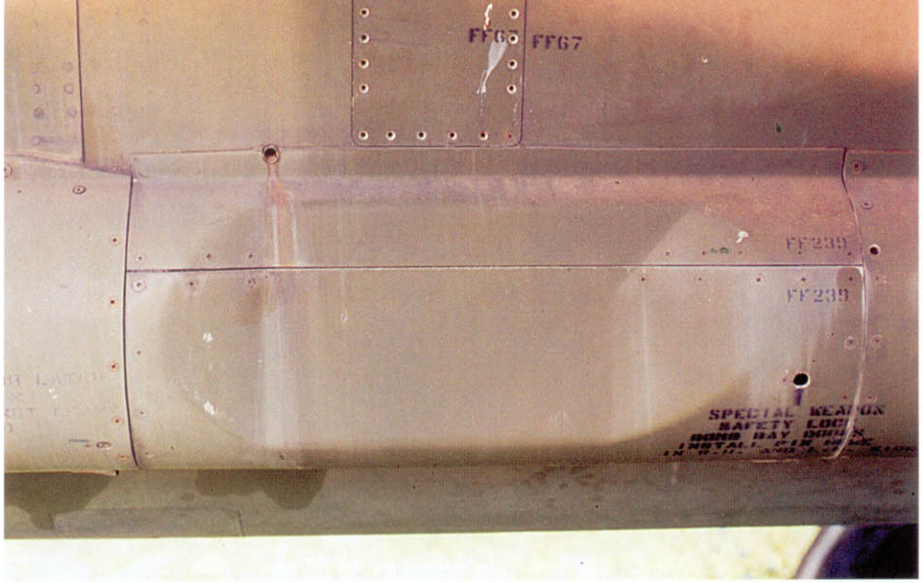




In 1967, the US Air Force (USAF) ordered all F-105Fs tasked with 'Wild Weasel' missions into North Vietnam to carry at least one Electronic Countermeasures (ECM) pod. A conventional pod took up valuable space on the wing stations. Fairchild Republic, the USAF, and Westinghouse combined to solve this problem by splitting the components of an AN/ALQ-101 ECM pod in half. Each half of the pod, redesignated AN/ALQ-105, was installed on the lower fuselage. (Cradle of Aviation Museum)

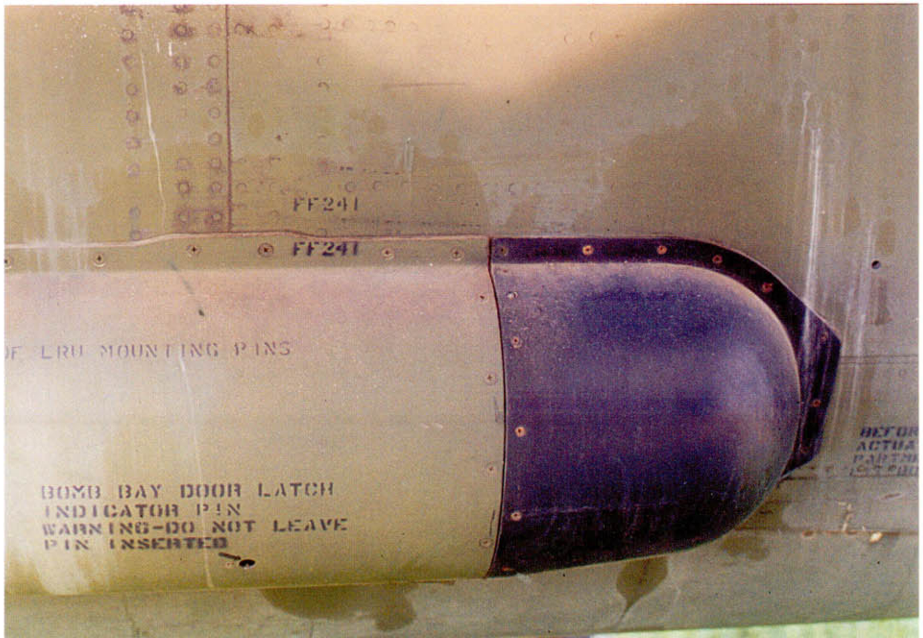
A water fill vent was placed in front of the middle receiver fairing of the port AN/ALQ-105 Electronic Countermeasures (ECM) pod. This allowed cooling water to be pumped into the pod. Immediately above the fairing is a circuit breaker for opening the electrical circuits within the ECM pod.

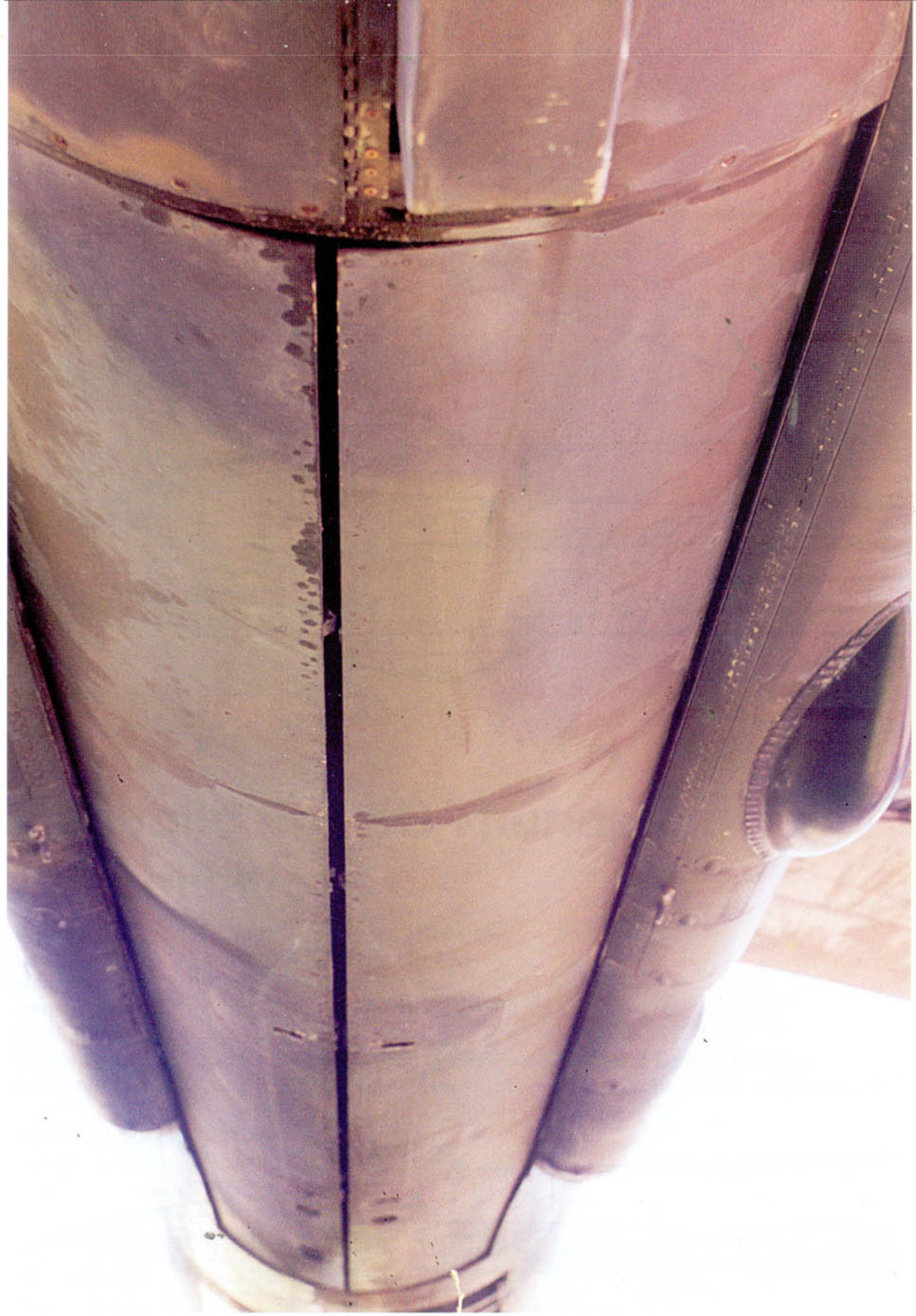

FF238
FF236
FF231
FF236
POWER RECEPT
CIRCUIT BREAKER
FF244
FF244
WATER
VENT FILL


FF67 FF67
FF239
FF239
SPECIAL WEAPON
SAFETY LOCK
BOMB BAY DOORS

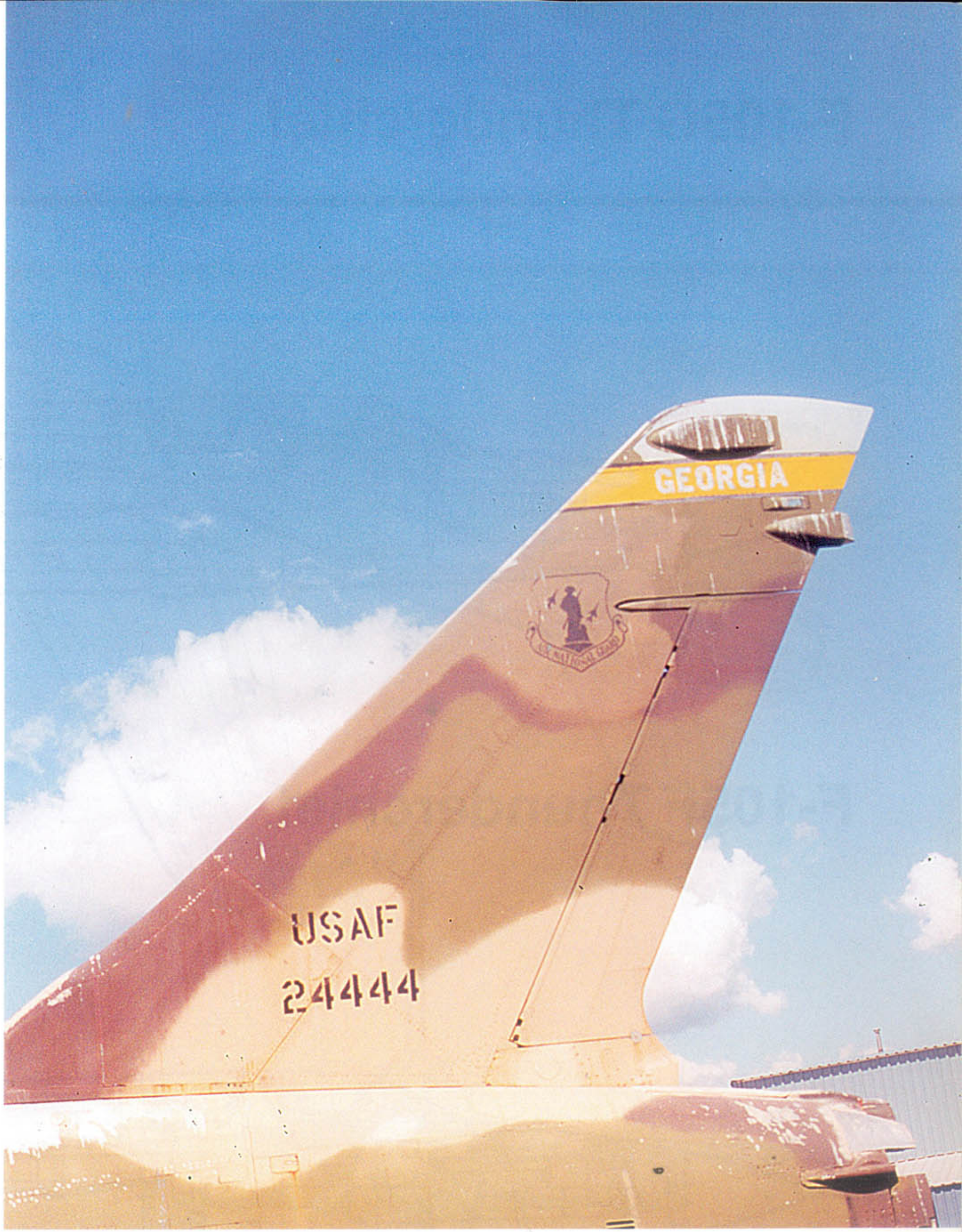
The AN/ALQ-105 ECM pod is indented near its aft end. This indentation allows for full clearance for the lowered inboard main landing gear door; however, the landing gear door has been raised on this displayed F-105G. Only two of the screws have been retained on the access panel located immediately above the ECM pod. The 54 F-105Fs receiving the AN/ALQ-105 were redesignated F-105Gs.

Access panels for the various electrical circuits are placed at the rear of the AN/ALQ-105 ECM pod. A rear-facing transmission antenna is at the far end of the pod; another transmission antenna is at the pod's front. The AN/ALQ-105 provided the F-105G with ECM support against various SAM (Surface to Air Missile) and AAA (Anti-Aircraft Artillery) defenses.


FF241
FF241
OF LRU MOUNTING PINS
BOMB BAY DOOR LATCH
INDICATOR PIN
WARNING-DO NOT LEAVE
PIN INSERTED

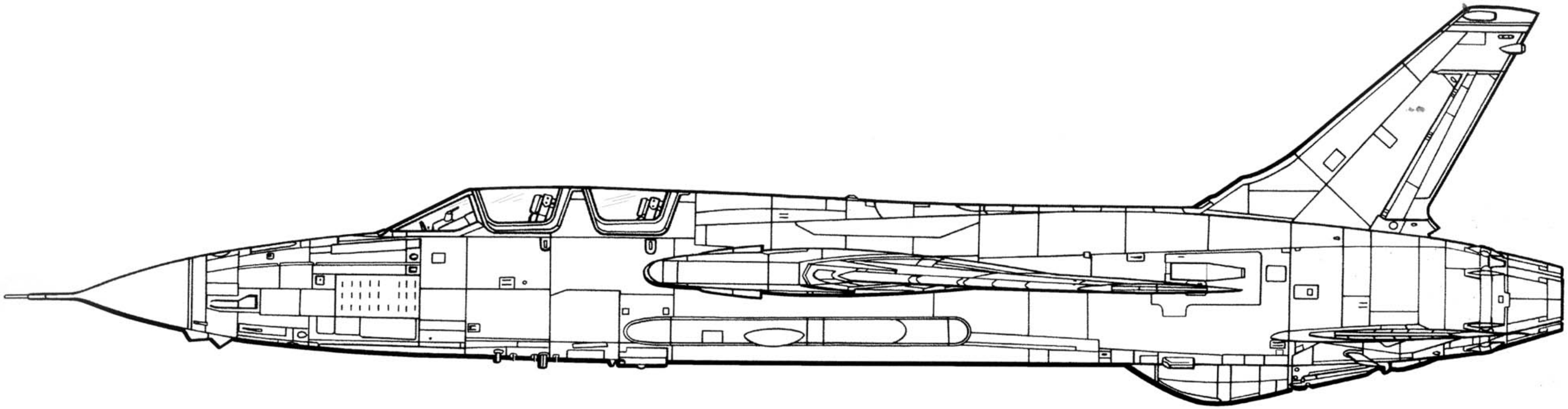


The AN/ALQ-105 ECM pods straddled the weapons bay doors on the F-105G. The internal weapons bay was originally intended for carrying nuclear weapons; however, this feature was rarely used for the intended purpose. A 390 gallon (1474 L) fuel tank was carried inside the weapons bay, while a pylon for an external tank or ordnance was often installed on the outside.

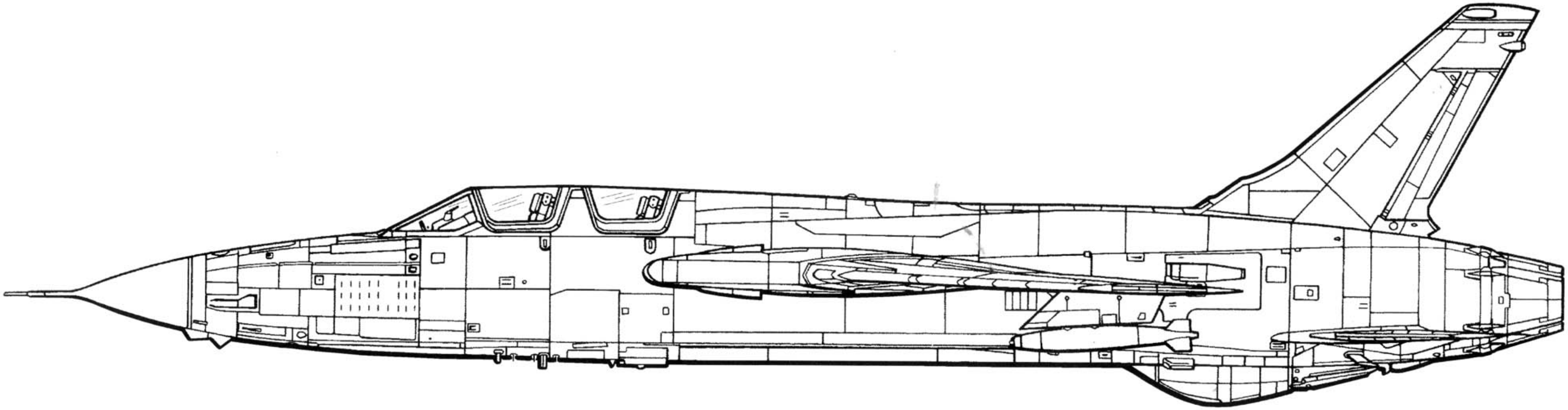


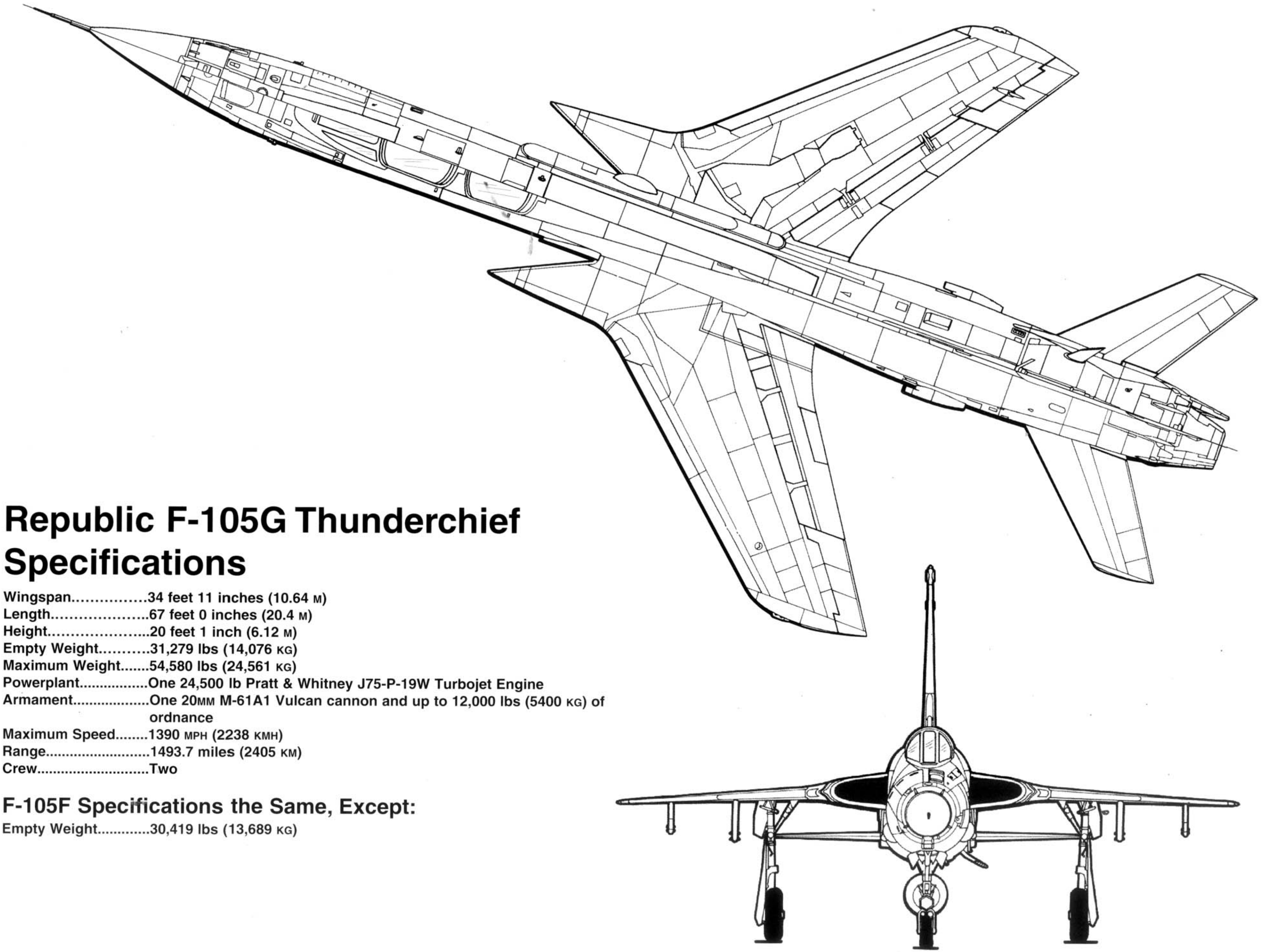
The longer F-105Fs and Gs used vertical fins, which were five inches (12.7 CM) taller than those on the earlier F-105Bs and Ds. Additionally, mission requirements in Vietnam dictated the addition of a more extensive electronic countermeasures (ECM) suite. This suite included additional fairings on the fin tip and upper trailing edge. These fairings were associated with the AN/APR-25(U)-26(V) Radar Homing And Warning (RHAW) system.

F-105G Thunderchief



F-105F Thunderchief



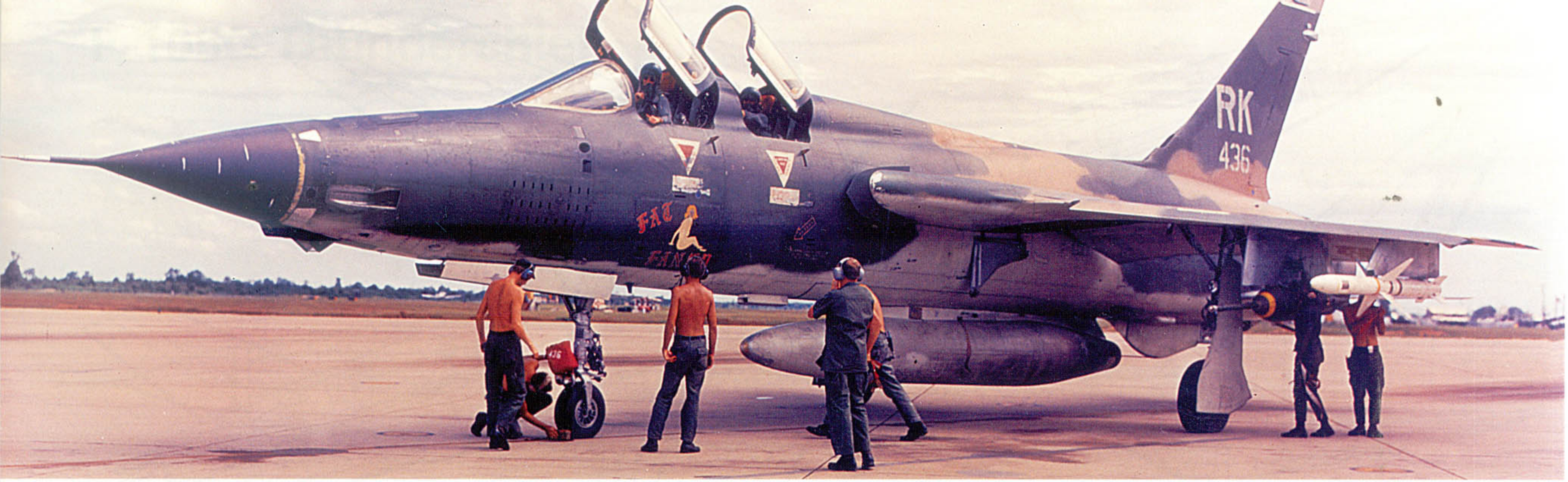


Republic F-105G Thunderchief Specifications

Wingspan	**34 feet 11 inches (10.64 M)**
Length	**67 feet 0 inches (20.4 M)**
Height	**20 feet 1 inch (6.12 M)**
Empty Weight	**31,279 lbs (14,076 KG)**
Maximum Weight	**54,580 lbs (24,561 KG)**
Powerplant	**One 24,500 lb Pratt & Whitney J75-P-19W Turbojet Engine**
Armament	**One 20MM M-61A1 Vulcan cannon and up to 12,000 lbs (5400 KG) of ordnance**
Maximum Speed	**1390 MPH (2238 KMH)**
Range	**1493.7 miles (2405 KM)**
Crew	**Two**

F-105F Specifications the Same, Except:

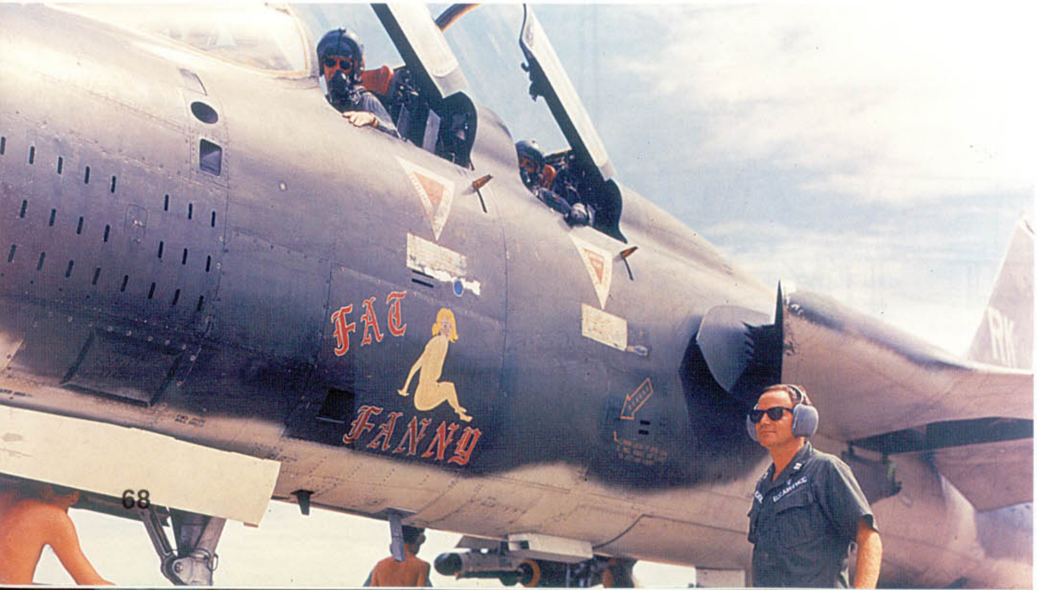
Empty Weight	30,419 lbs (13,689 KG)

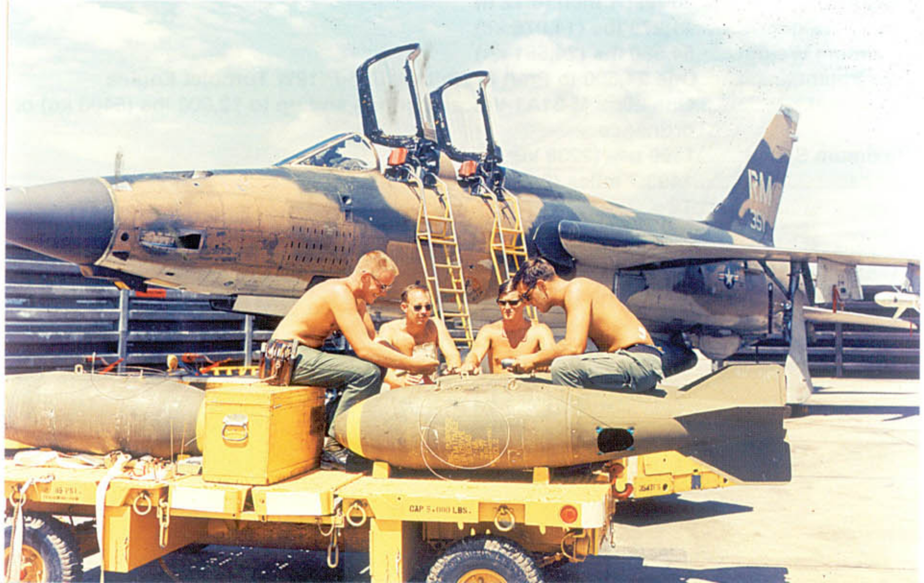


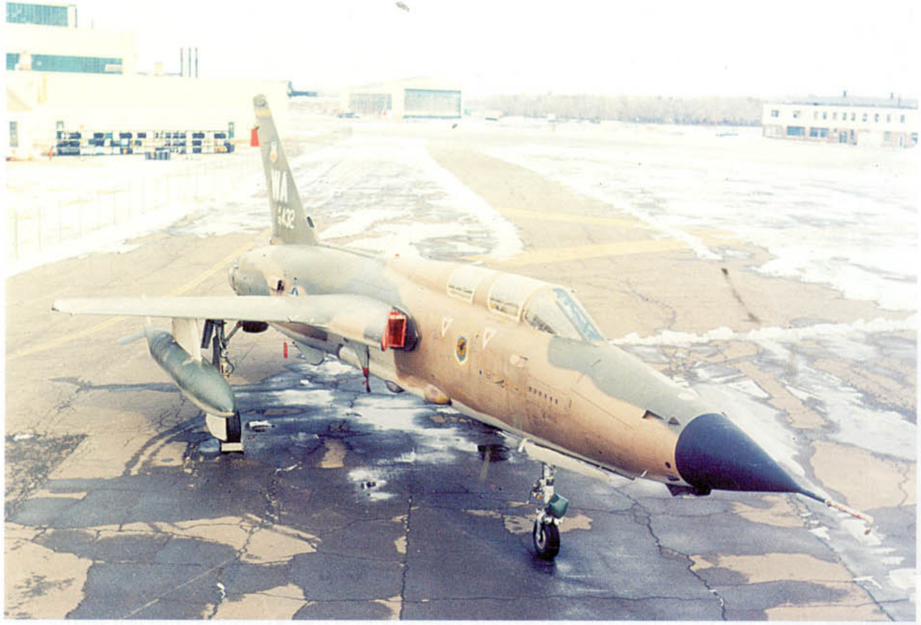
(Below) F-105F FAT FANNY prepares to depart from Takhli on a mission over Vietnam. Both canopy-open levers just under the aft ends of the canopy sills are in the up position for opening each canopy. A 500 lb bomb with an extended fuse is mounted on the right inboard wing pylon, while an ECM pod is fitted to the outboard wing pylon. A Shrike on one side and an ECM pod on the other was a common arrangement. The IFF (Identification Friend or Foe) antenna is immediately aft of the nose landing gear bay, followed by the UHF (Ultra High Frequency) radio antenna. (Cradle of Aviation Museum)

(Above) FAT FANNY, an F-105F (62-4436) assigned to the 333rd Tactical Fighter Squadron (TFS), 355th Tactical Fighter Wing (TFW), is prepared for flight by ground crew at Korat Royal Thai Air Base (RTAB), Thailand in December of 1968. The Thunderchief carries an AGM-45 Shrike anti-radiation missile on the outboard port wing pylon, a 500 lb (225 KG) Mk 82 bomb with extended fuse on the inboard wing pylon, and a 650 gallon (2457 L) fuel tank on the fuselage centerline. (Cradle of Aviation Museum)

(Below) Ground crewmen prepare a 750 pound (337.5 KG) Mk 117 bomb prior to loading onto the inside wing station of a 354th TFS F-105F (63-8351) at Korat RTAB, Thailand in December of 1968. The four bombs loaded on the trailer will be attached to a Multiple Ejector Rack (MER) for loading onto the aircraft centerline. The aircraft is already armed with an AGM-45 Shrike anti-radiation missile on the outboard port wing pylon. (Cradle of Aviation Museum)

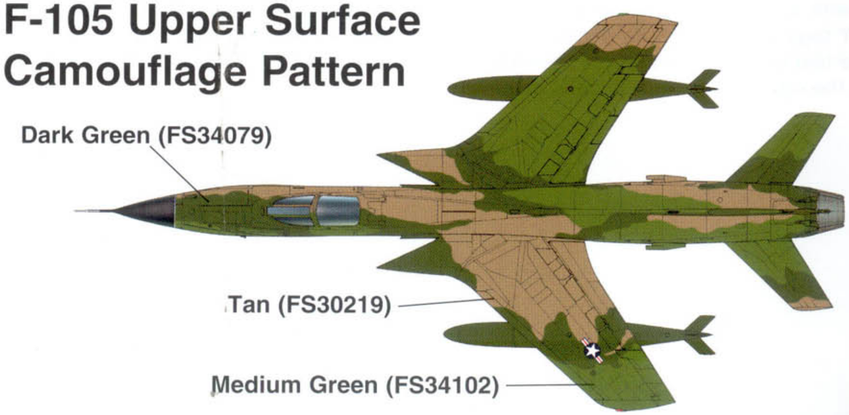


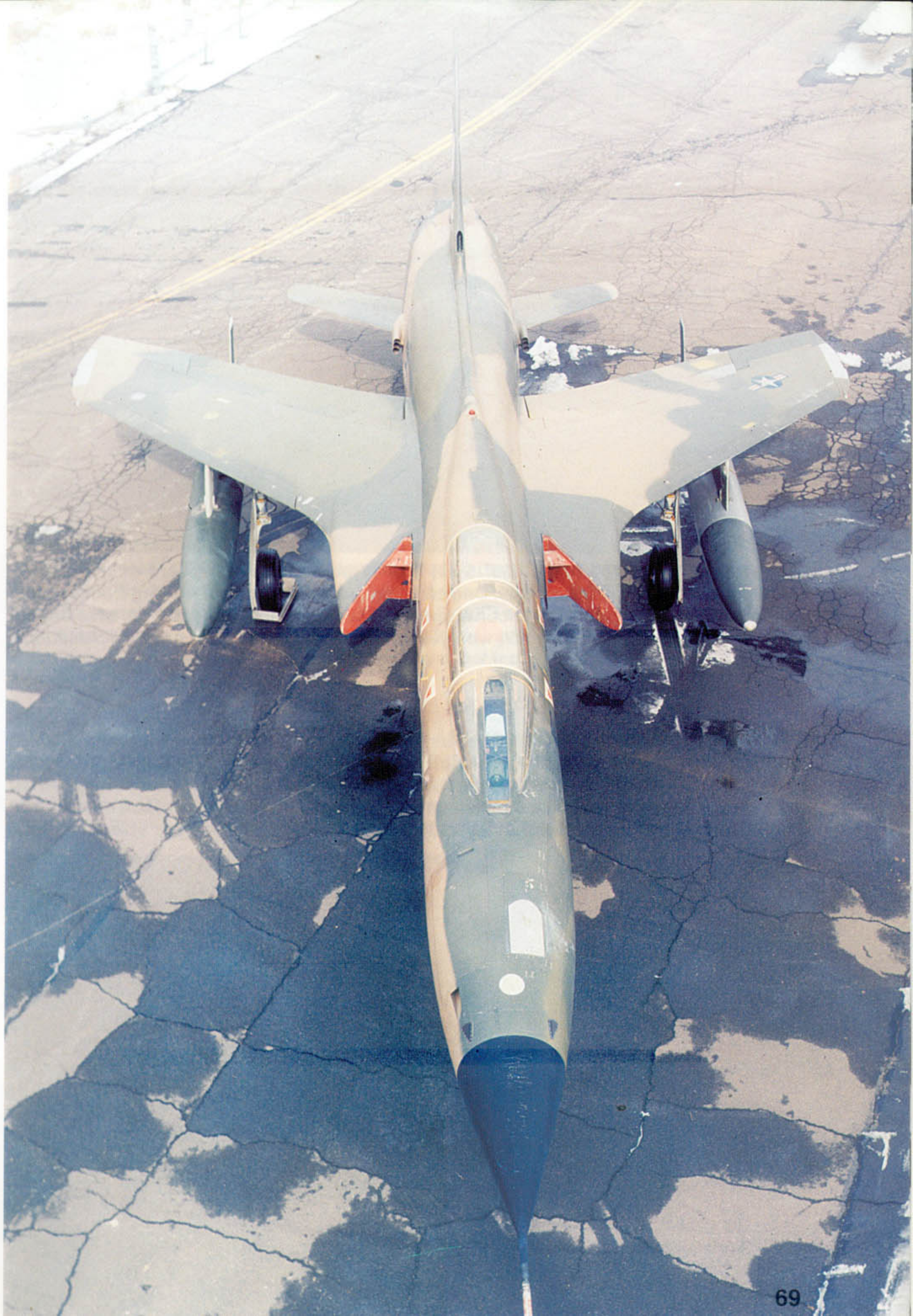




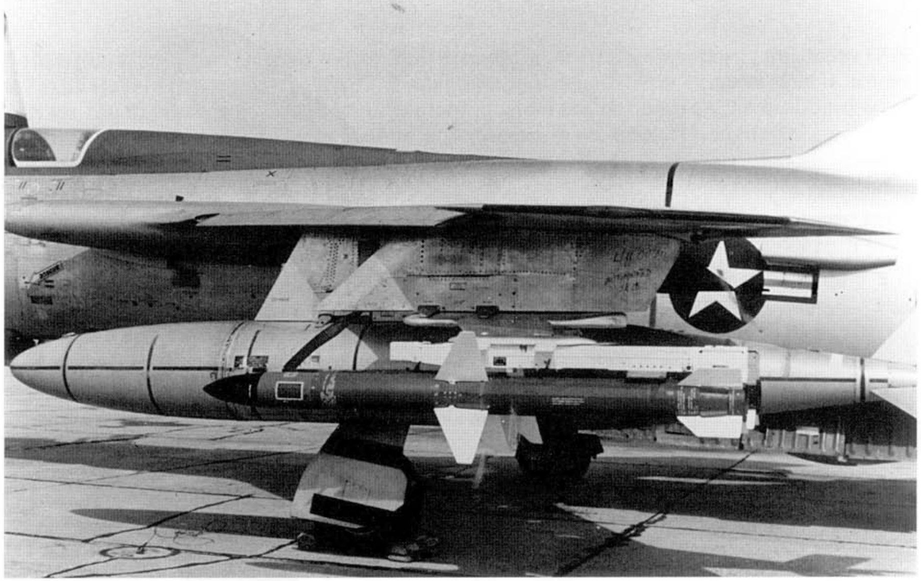
F-105G (62-4432) was parked on the ramp at Fairchild Republic's Farmingdale plant in February of 1974. This aircraft was assigned to the 57th Fighter Weapons Wing at Nellis AFB, Nevada for training F-105G crews. The F-105G was an F-105F equipped with AN/ALQ-105 Electronic Countermeasures (ECM) pods installed on the fuselage under both wings. Fairchild Republic rebuilt 54 F-105Fs into F-105G standard during the early 1970s; the F-105G remained in service until 1983. (Cradle of Aviation Museum)

F-105 Upper Surface Camouflage Pattern



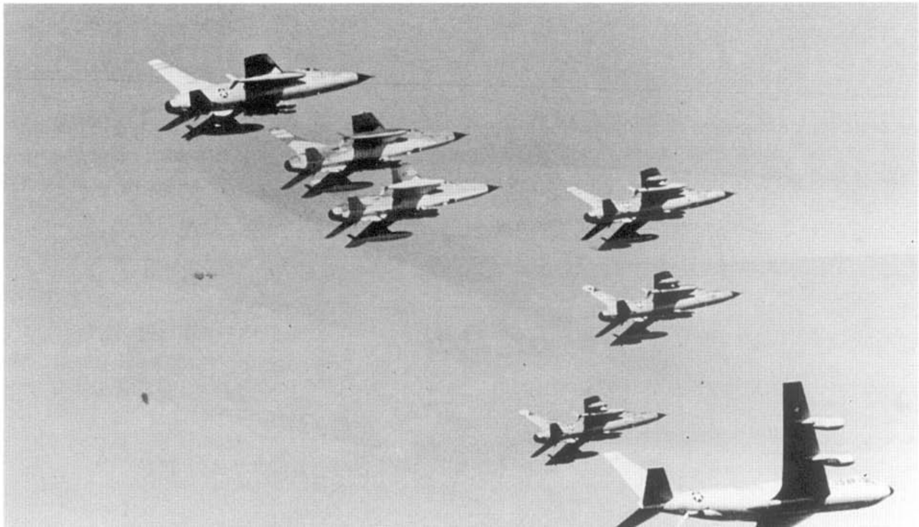


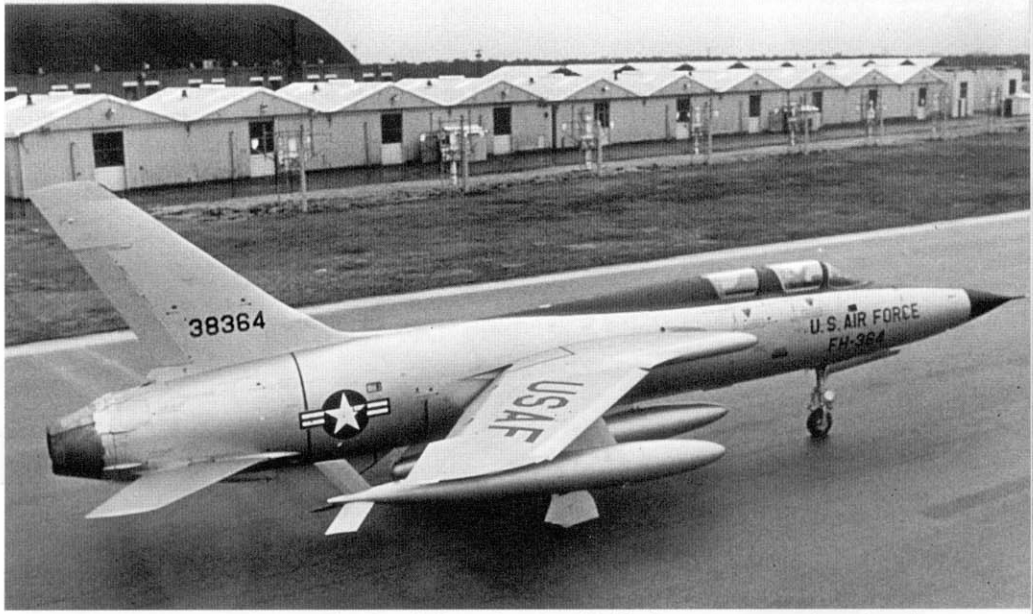
The light gray in-flight refueling boom receptacle door is placed on the forward upper fuselage of the F-105G. The gray circle ahead of the boom receptacle door is the AN/APX-72 IFF (Identification Friend or Foe) antenna. The spine running from behind the canopy to the base of the vertical stabilizer housed additional electrical wiring for the F-105G. Red covers on the intakes prevent FOD (Foreign Object Damage) to the J75 engine. The F-105G is carrying two 450 gallon (1710 L) fuel tanks under the wings. (Cradle of Aviation Museum)



This F-105F carries two AGM-45 Shrike anti-radiation missiles on a twin launcher mounted on the port outboard wing pylon. The inert Shrikes were painted Dark Blue (FS35109) with black nose and white fins. The twin launcher was unpopular with Thunderchief crews due to vibration problems caused by launching only one Shrike from each launcher. The 450 gallon fuel tank on the inboard pylon is painted with photo calibration lines for stores release testing. (Cradle of Aviation Museum)

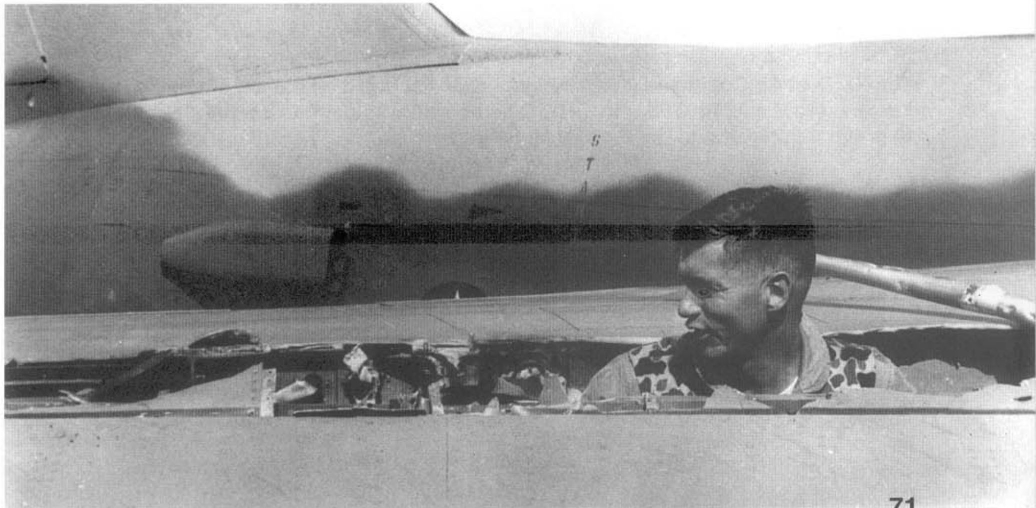
An F-105D receives fuel from a Boeing KC-135 Stratotanker while other Thunderchiefs wait their turn over Vietnam during February of 1966. The F-105s were uniquely capable of receiving fuel from either boom-equipped Strategic Air Command (SAC) tankers or drogue-fitted Tactical Air Command (TAC) tankers. All eight Thunderchiefs are armed with six bombs on the centerline and carry 450 gallon wing fuel tanks. (Cradle of Aviation Museum)



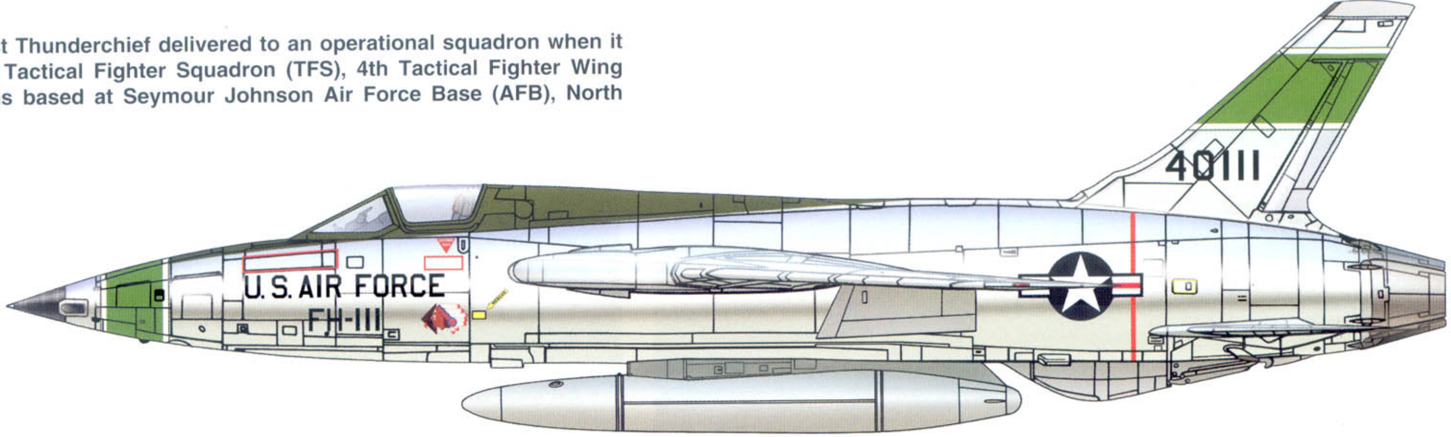


One of the last F-105Fs (63-8364) to be delivered to the US Air Force prepares for takeoff from Republic Airport in Farmingdale, New York on 4 January 1965. Republic built 143 F-105Fs – originally ordered by the Air Force as F-105D single seaters – from 1963 to 1965. This brought total Thunderchief production to 828 aircraft. The F-105F is painted overall Aluminum with Olive Drab panels in front of and behind the canopy. (Cradle of Aviation Museum)

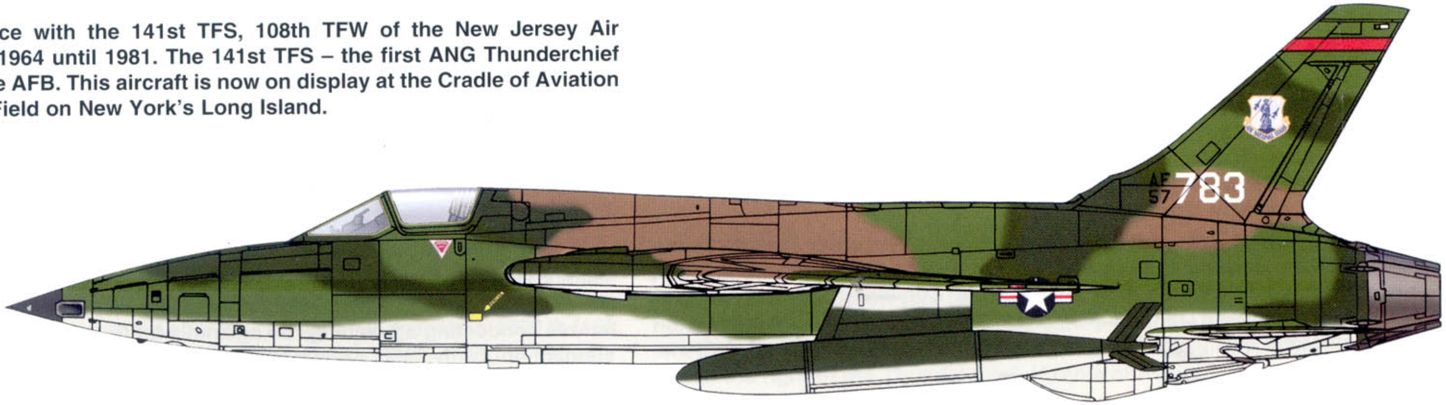
Major William McClelland puts his head through a hole in the starboard wing of his F-105D (60-454). The damage was inflicted by North Vietnamese AAA (Anti-Aircraft Artillery) while he was conducting a bombing run against a bridge spanning the Kuih Bich Dong River in Vietnam on 7 July 1966. After McClelland was hit, he flew over 500 miles (805 KM) back to base, including one in-flight refueling. (Cradle of Aviation Museum)



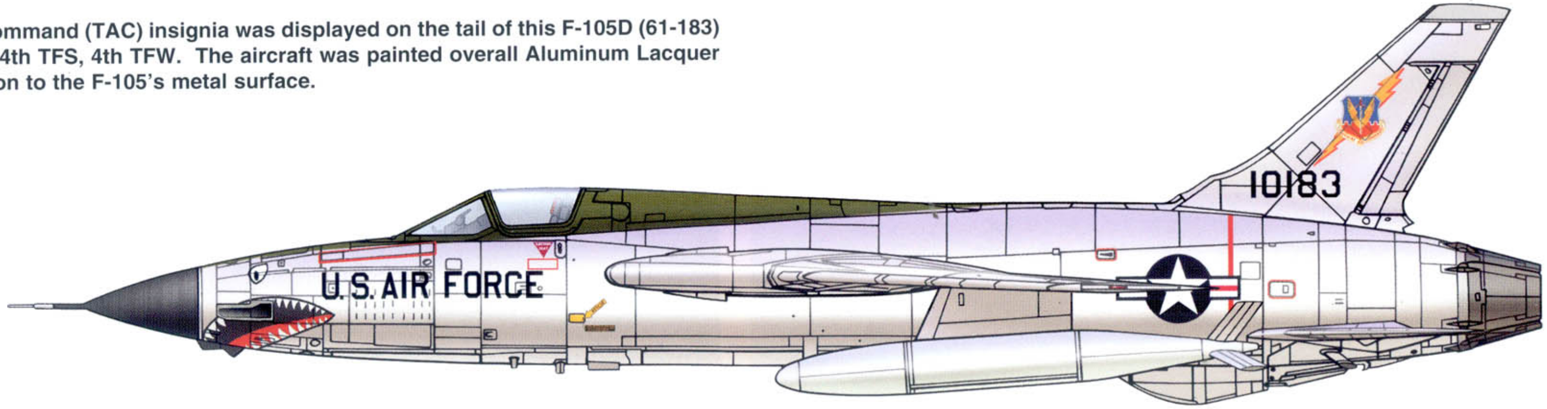
F-105B (54-111) was the first Thunderchief delivered to an operational squadron when it was assigned to the 335th Tactical Fighter Squadron (TFS), 4th Tactical Fighter Wing (TFW) in 1958. The unit was based at Seymour Johnson Air Force Base (AFB), North Carolina.



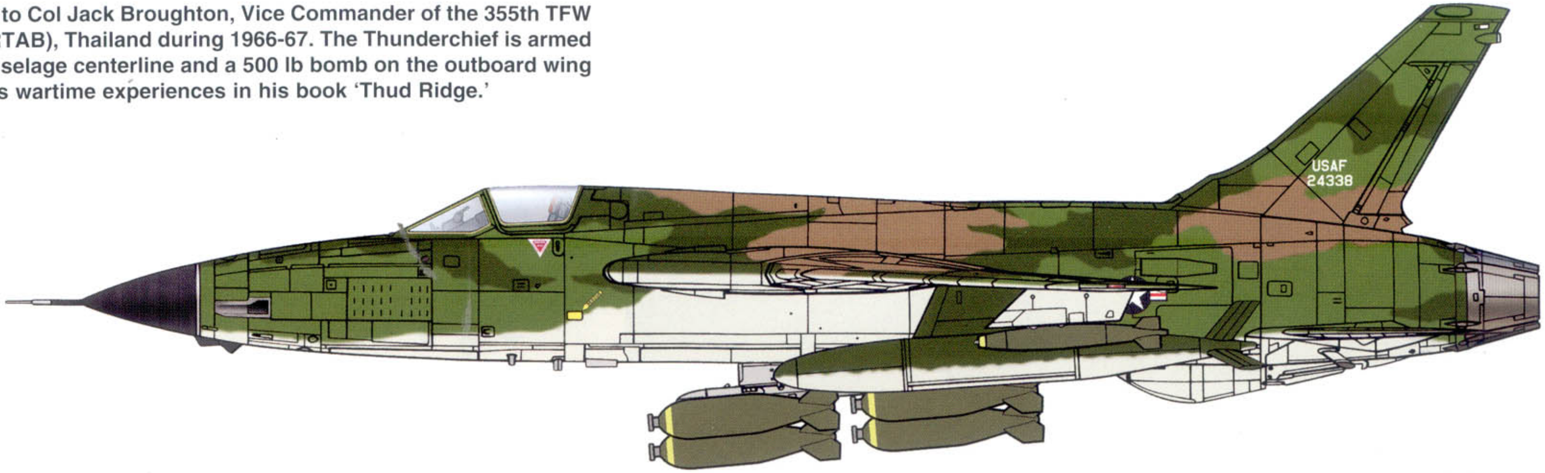
F-105B (57-5783) saw service with the 141st TFS, 108th TFW of the New Jersey Air National Guard (ANG) from 1964 until 1981. The 141st TFS – the first ANG Thunderchief unit – operated from McGuire AFB. This aircraft is now on display at the Cradle of Aviation Museum, located at Michel Field on New York's Long Island.



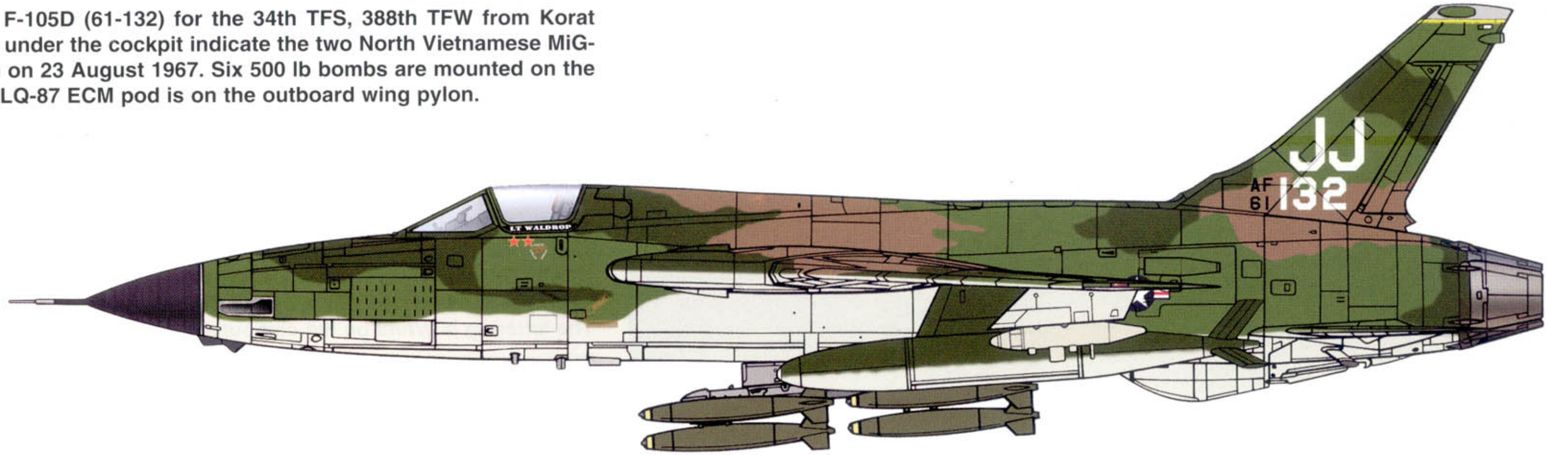
The Tactical Air Command (TAC) insignia was displayed on the tail of this F-105D (61-183) assigned to the 334th TFS, 4th TFW. The aircraft was painted overall Aluminum Lacquer to prevent corrosion to the F-105's metal surface.



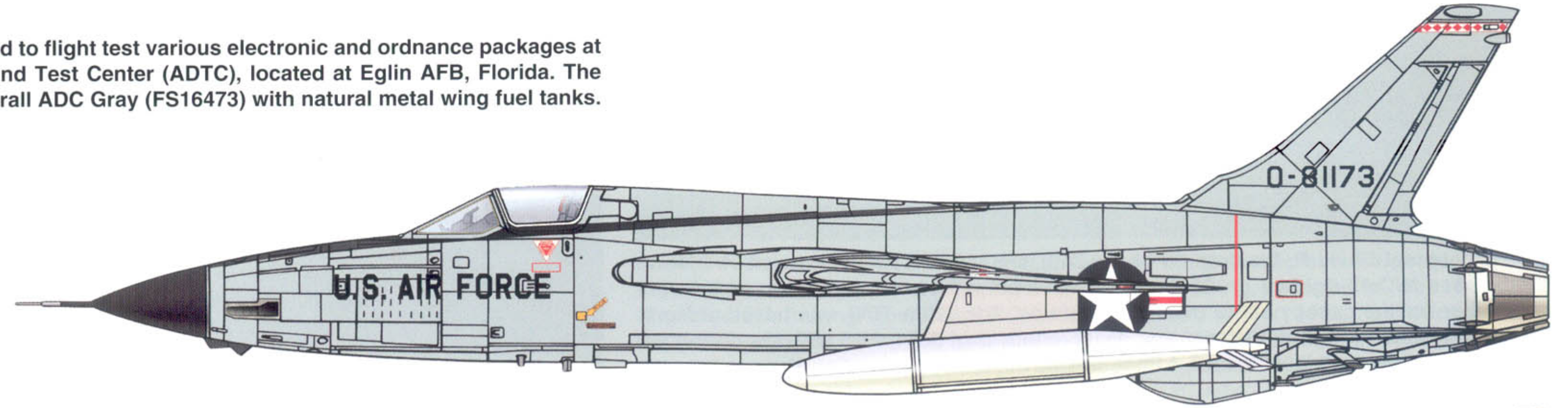
F-105D (62-4338) was assigned to Col Jack Broughton, Vice Commander of the 355th TFW at Takhli Royal Thai Air Base (RTAB), Thailand during 1966-67. The Thunderchief is armed with six 750 lb bombs on the fuselage centerline and a 500 lb bomb on the outboard wing pylon. Broughton recounted his wartime experiences in his book 'Thud Ridge.'

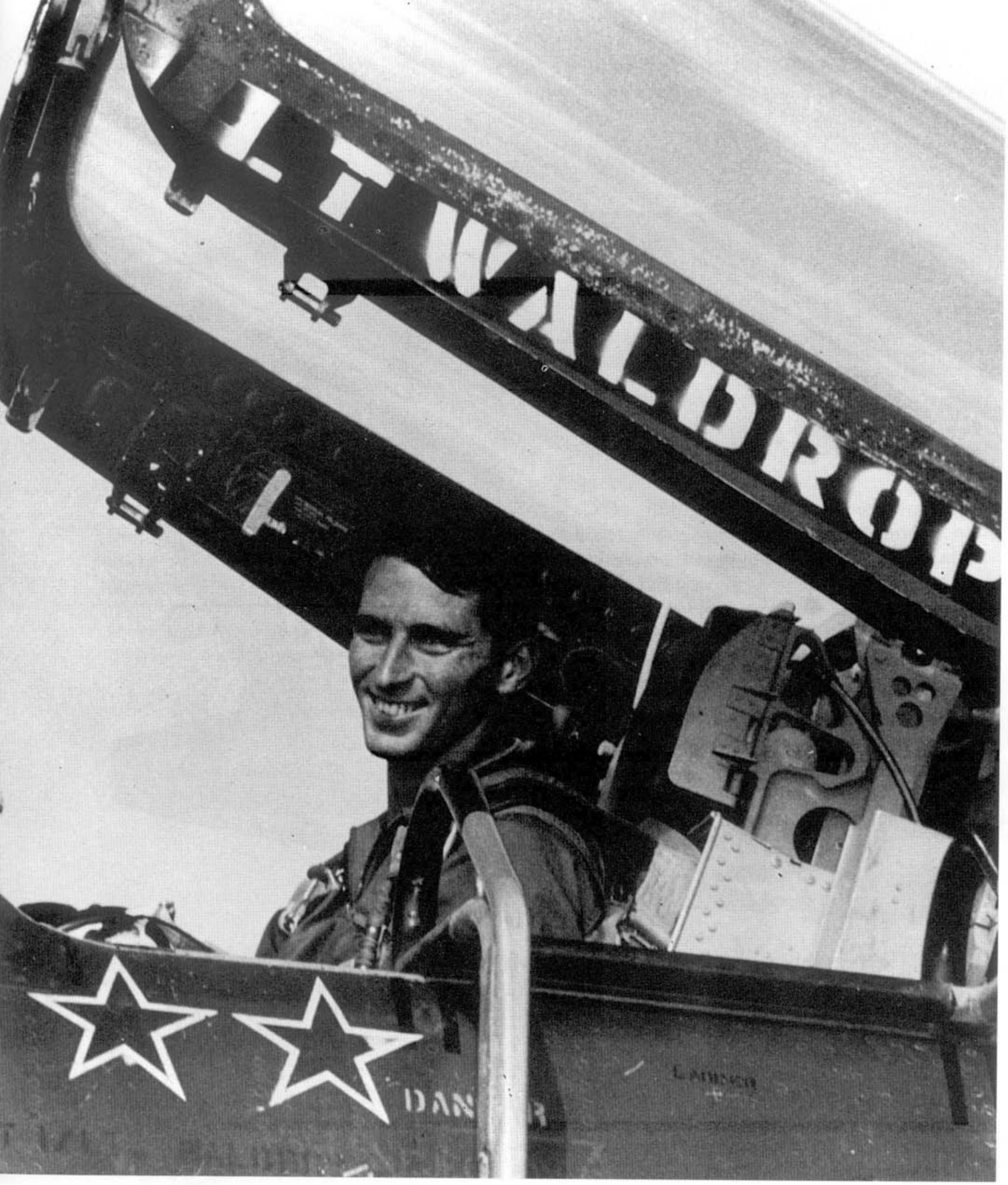


1Lt David B. Waldrop, III flew F-105D (61-132) for the 34th TFS, 388th TFW from Korat RTAB, Thailand. Two red stars under the cockpit indicate the two North Vietnamese MiG-17 fighters Waldrop shot down on 23 August 1967. Six 500 lb bombs are mounted on the fuselage centerline, while an ALQ-87 ECM pod is on the outboard wing pylon.

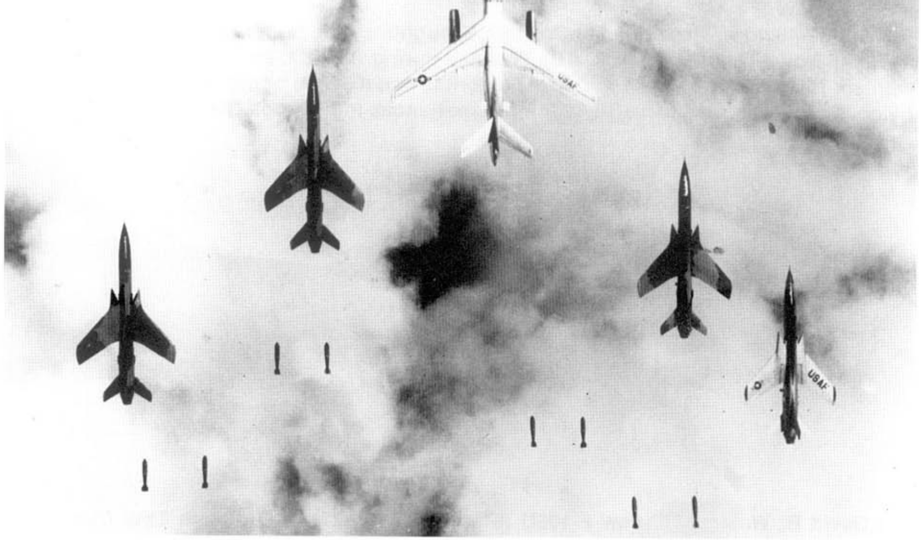


This F-105D (58-1173) was used to flight test various electronic and ordnance packages at the Armament Development and Test Center (ADTC), located at Eglin AFB, Florida. The Thunderchief was painted overall ADC Gray (FS16473) with natural metal wing fuel tanks.



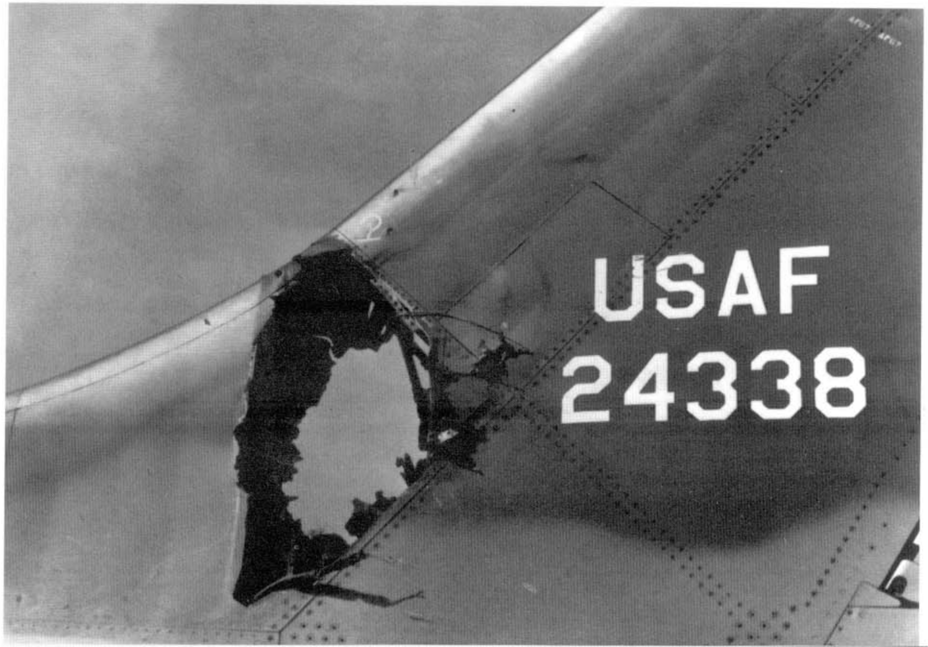


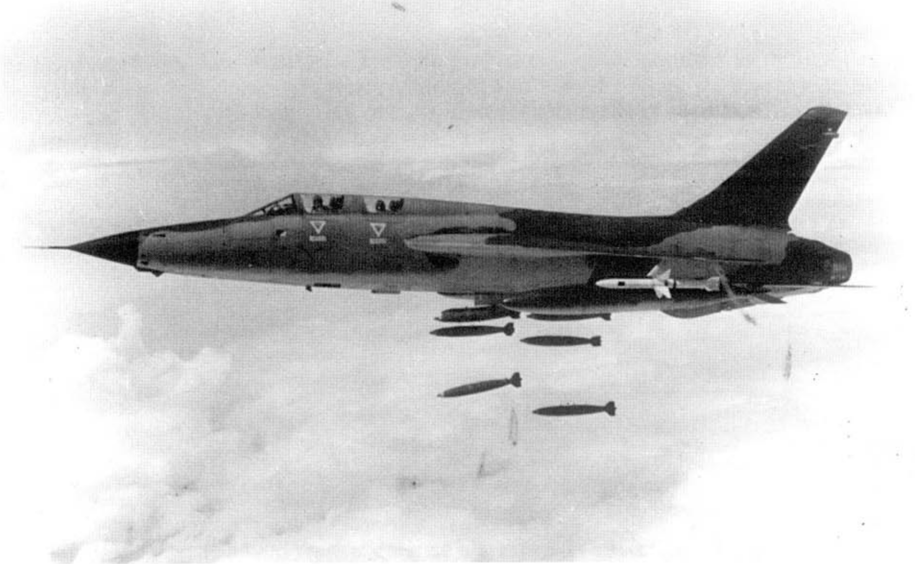
First Lieutenant David P. Waldrop, III of the 34th TFS, 388th TFW shot down two North Vietnamese MiG-17 fighters on 23 August 1967. Two red stars bordered in white were painted under the canopy sill to mark his victories. The 388th TFW was based at Korat RTAB, Thailand during the Vietnam War. F-105 pilots shot down 27.5 MiG-17s during the conflict, sharing one 'kill' with an F-4 Phantom crew. (Cradle of Aviation Museum)



Four F-105Ds drop their 750 pound bombs on cue from a Douglas EB-66 Destroyer during a radar bombing run over Vietnam on 27 September 1966. The EB-66 and the F-105 at the far right of the formation have not yet received their camouflage finish. Radar bombing missions from high altitude became more dangerous when North Vietnamese fighters and Surface to Air Missiles (SAMs) became a greater threat during the war. (Cradle of Aviation Museum)

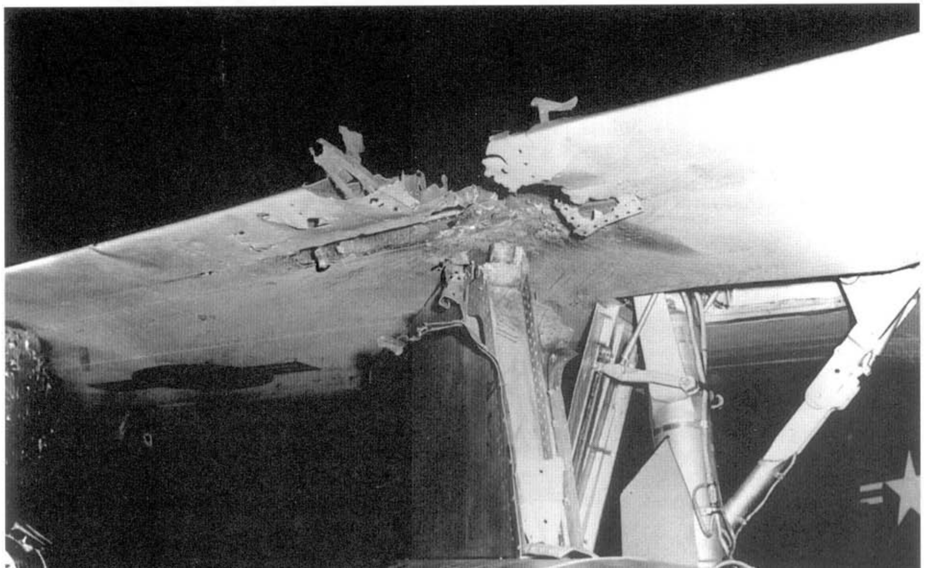
The F-105 received a reputation as an aircraft that could sustain much damage and return back to base during its service in Vietnam. This F-105D (62-4338) returned back to Takhli RTAB, Thailand with a hole in the tail section that was made by a missile on 24 July 1967. The Thunderchief was flown by Col Jack Broughton, Vice Commander of the 355th TFW. The lettering is White on the camouflage finish. (Cradle of Aviation Museum)

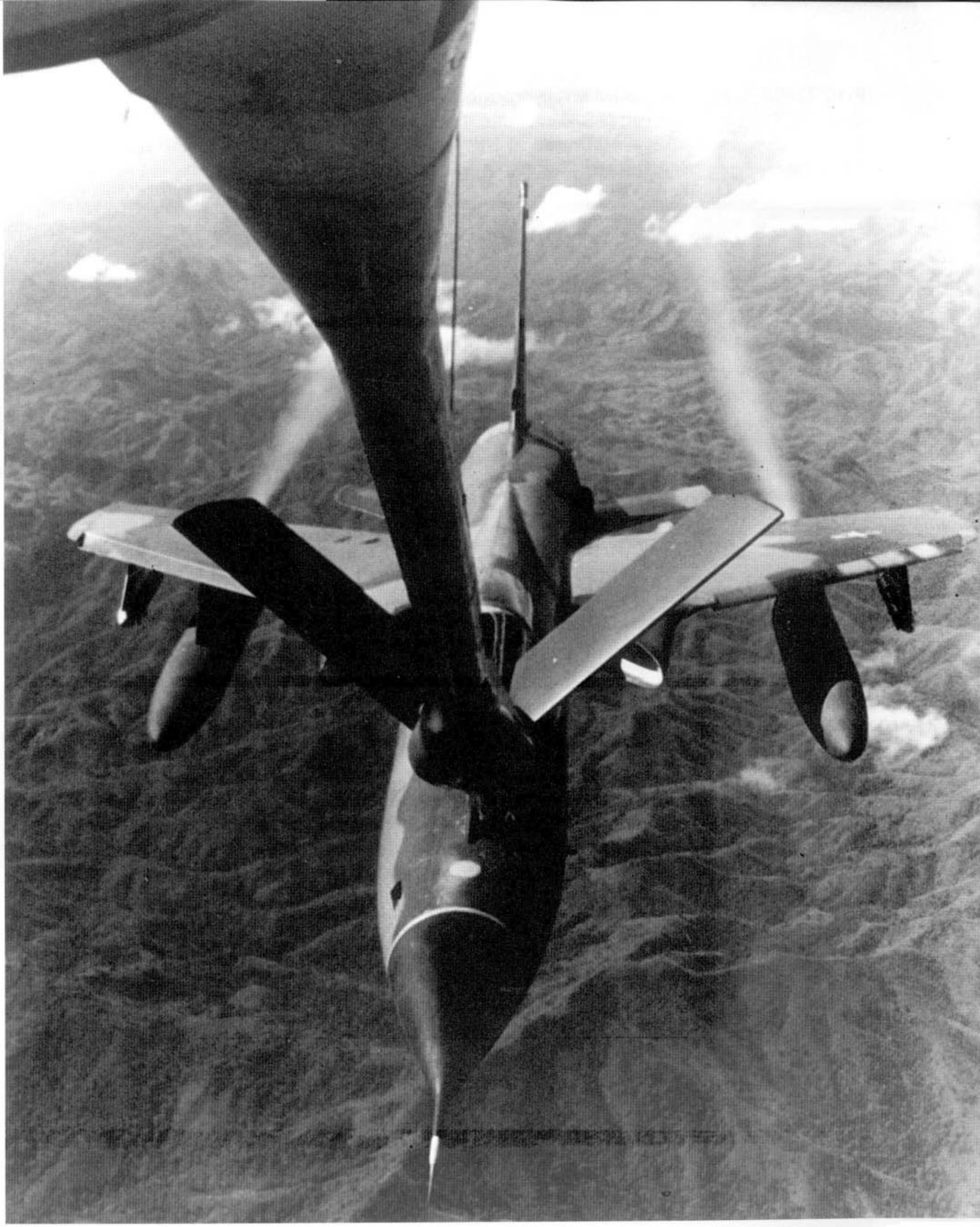




An F-105F drops six 500 pound (225 KG) Mk 82 bombs on a mission over Vietnam during October of 1967. The Thunderchief is also armed with an AGM-45 Shrike Anti-Radiation Missile (ARM) on the outboard wing pylon. A 450 gallon fuel tank is mounted on the inboard wing pylon. The aircraft is camouflaged in Dark Green (FS34079), Medium Green (FS34102), and Tan (FS30219) over Light Gray (FS36622) undersurfaces. (Cradle of Aviation Museum)

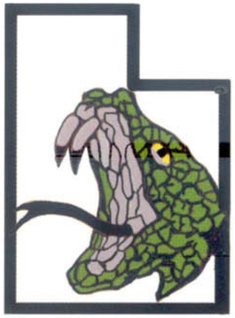
The starboard wing leading edge of an F-105D (62-4234) displays battle damage sustained over Vietnam on 4 December 1967. The hole punched by gunfire through the leading edge flap reveals some of the flap structure. Combat and operational accidents resulted in the loss of 397 F-105s during the Vietnam War – 53 percent of the 750 Thunderchiefs used in the conflict. (Cradle of Aviation Museum)

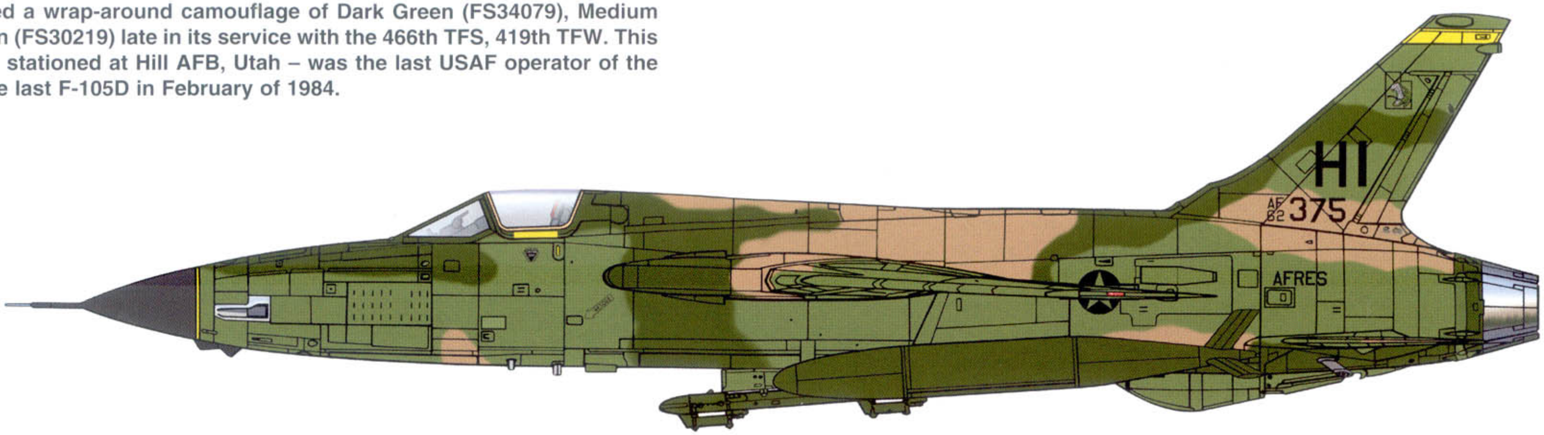




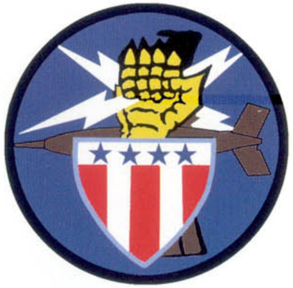
The KC-135's refueling boom is connected to the F-105D's receptacle for a refueling during August of 1968. The Boeing-developed refueling receptacle was fitted to Thunderchiefs during Operation LOOK ALIKE modifications in 1962. Fuel streams from the F-105's wing mounted 450 gallon drop tanks. An AN/ALQ-87 ECM pod is mounted on the starboard outer wing pylon. An empty port outboard wing pylon indicated this Thunderchief was returning to base after a mission. (Cradle of Aviation Museum)

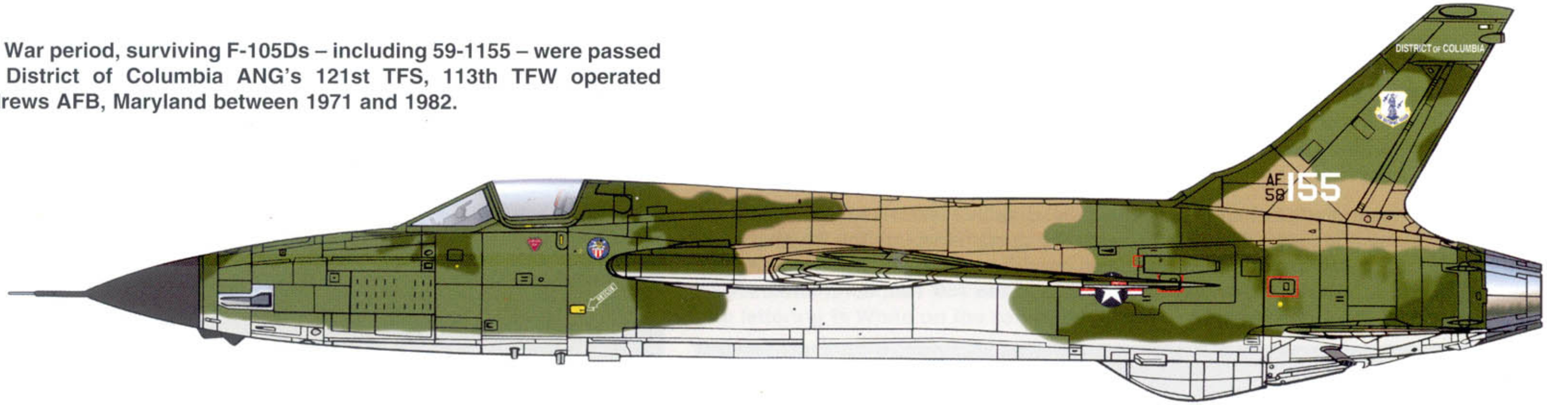
F-105D (62-4375) received a wrap-around camouflage of Dark Green (FS34079), Medium Green (FS34102), and Tan (FS30219) late in its service with the 466th TFS, 419th TFW. This Air Force Reserve unit – stationed at Hill AFB, Utah – was the last USAF operator of the Thunderchief, retiring the last F-105D in February of 1984.



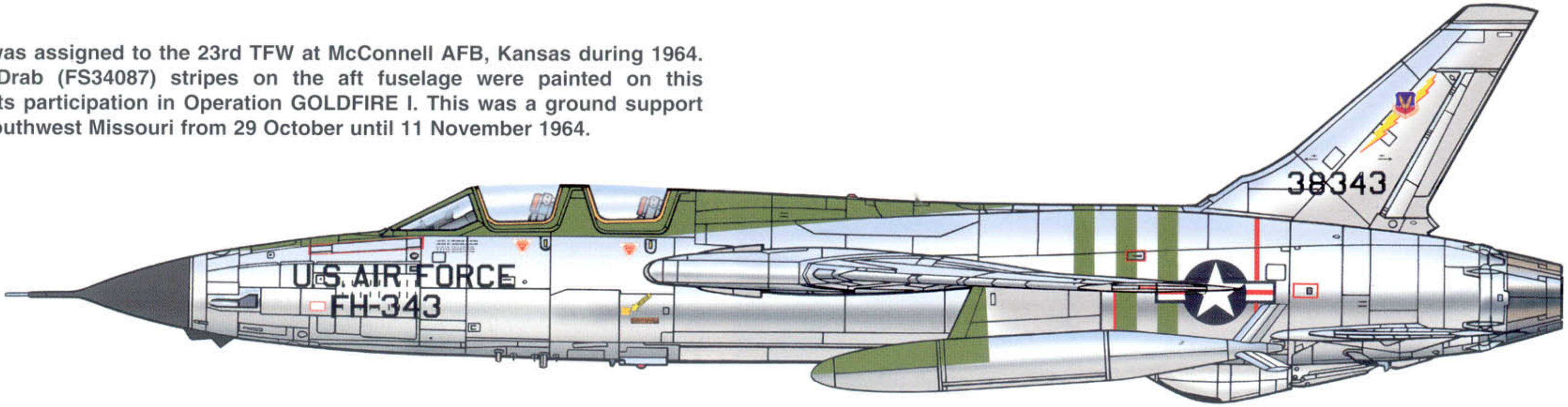


During the post-Vietnam War period, surviving F-105Ds – including 59-1155 – were passed on to ANG units. The District of Columbia ANG's 121st TFS, 113th TFW operated Thunderchiefs from Andrews AFB, Maryland between 1971 and 1982.

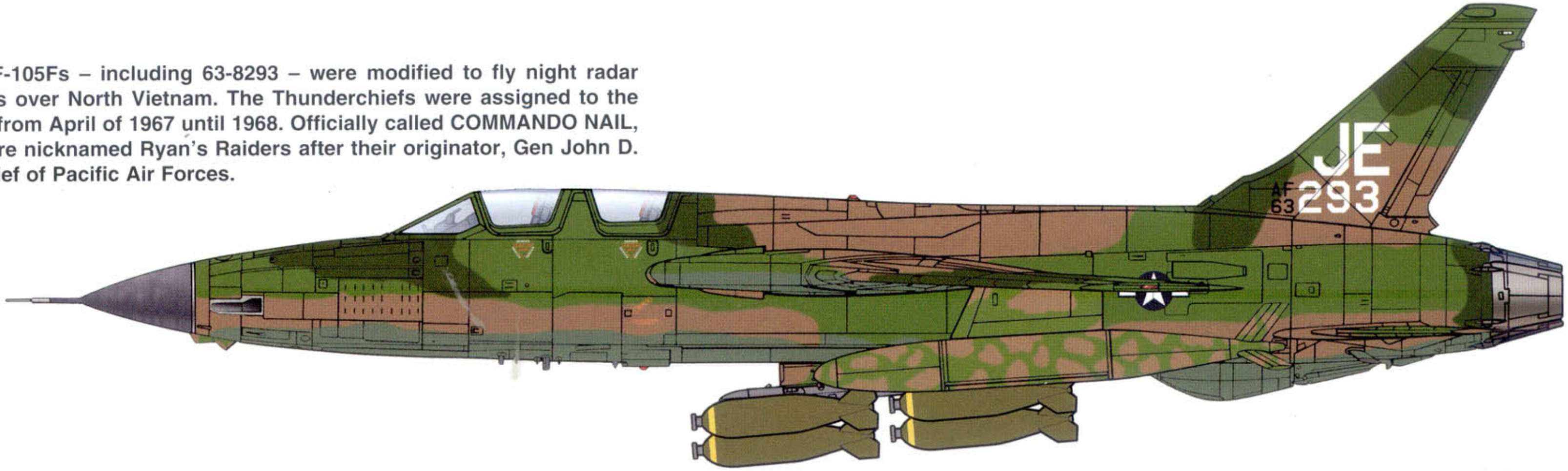




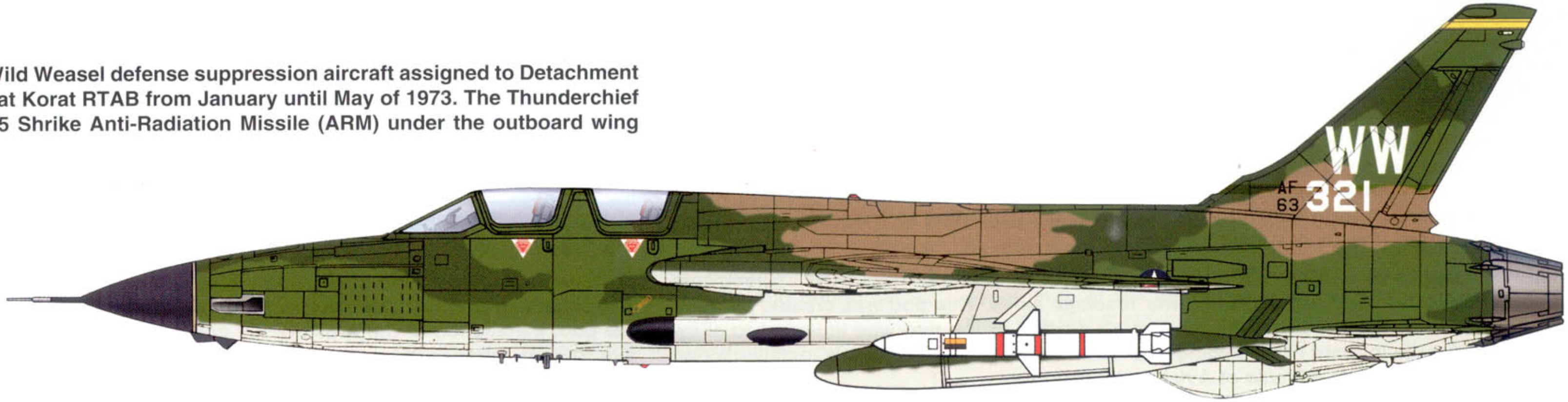
F-105F (63-8343) was assigned to the 23rd TFW at McConnell AFB, Kansas during 1964. The three Olive Drab (FS34087) stripes on the aft fuselage were painted on this Thunderchief for its participation in Operation GOLDFIRE I. This was a ground support exercise held in southwest Missouri from 29 October until 11 November 1964.



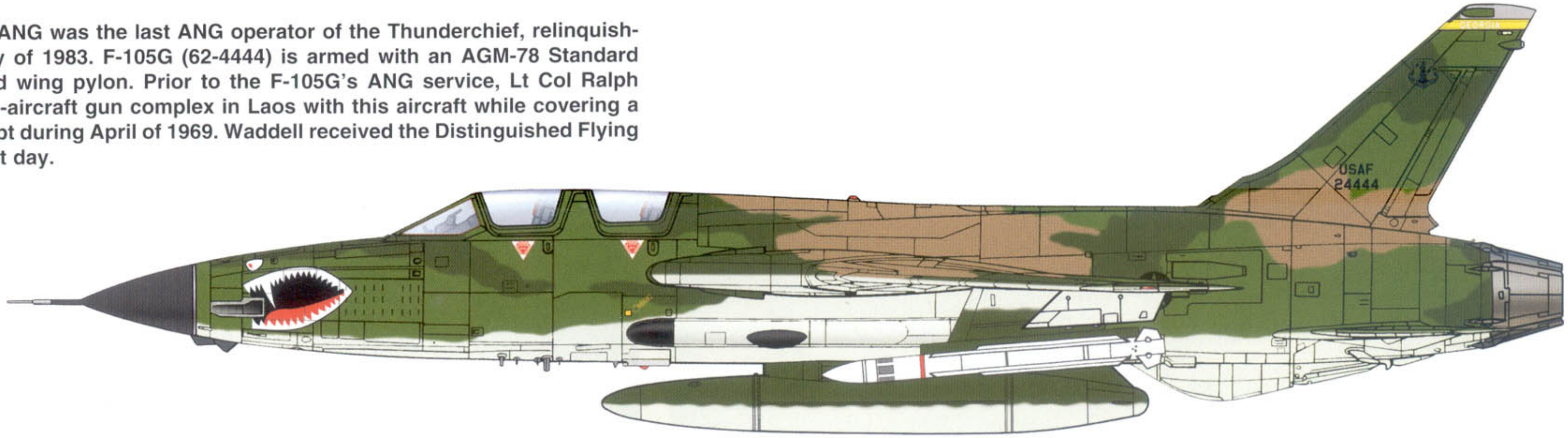
In March of 1967, four F-105Fs – including 63-8293 – were modified to fly night radar bombing attack missions over North Vietnam. The Thunderchiefs were assigned to the 44th TFS at Korat RTAB from April of 1967 until 1968. Officially called COMMANDO NAIL, the modified F-105Fs were nicknamed Ryan's Raiders after their originator, Gen John D. Ryan, Commander in Chief of Pacific Air Forces.

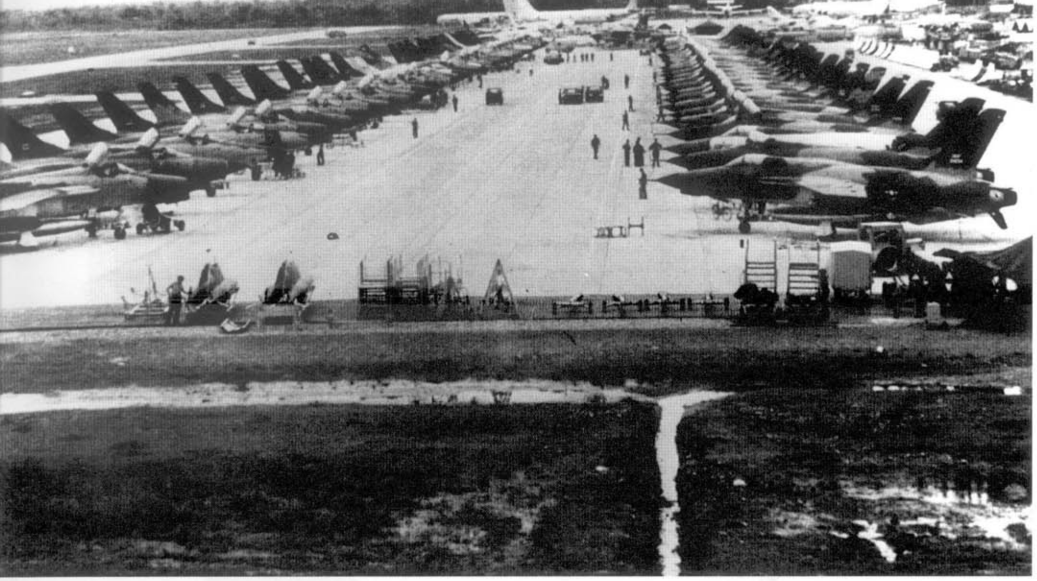


F-105G (63-8321) was a Wild Weasel defense suppression aircraft assigned to Detachment 1, 561st TFS, 388th TFW at Korat RTAB from January until May of 1973. The Thunderchief is armed with an AGM-45 Shrike Anti-Radiation Missile (ARM) under the outboard wing pylon.



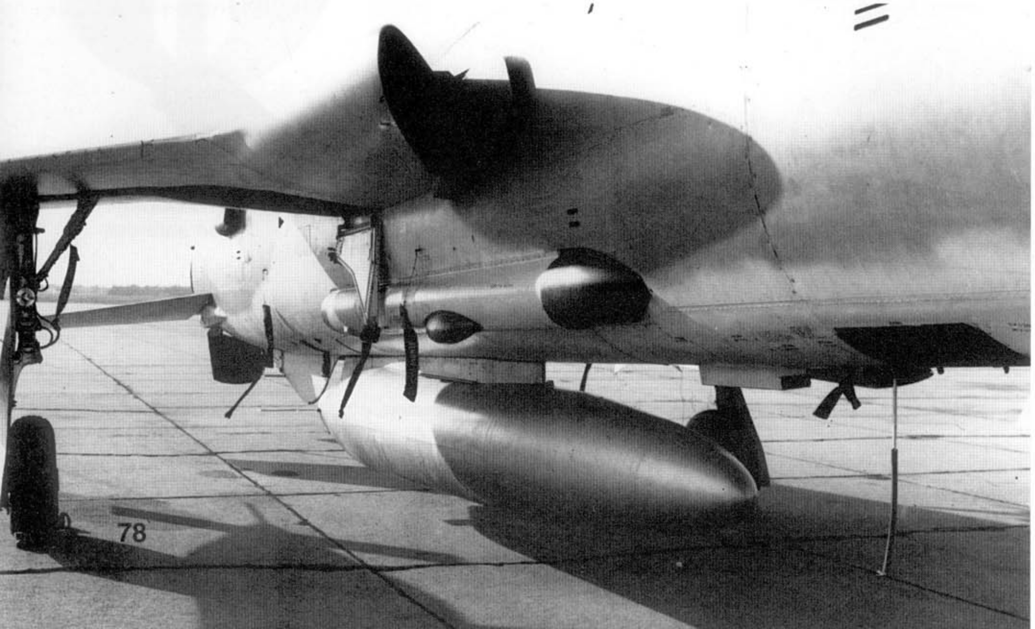
The 128th TFS, Georgia ANG was the last ANG operator of the Thunderchief, relinquishing their F-105Gs in May of 1983. F-105G (62-4444) is armed with an AGM-78 Standard ARM under the outboard wing pylon. Prior to the F-105G's ANG service, Lt Col Ralph Waddell attacked an anti-aircraft gun complex in Laos with this aircraft while covering a search and rescue attempt during April of 1969. Waddell received the Distinguished Flying Cross for his actions that day.

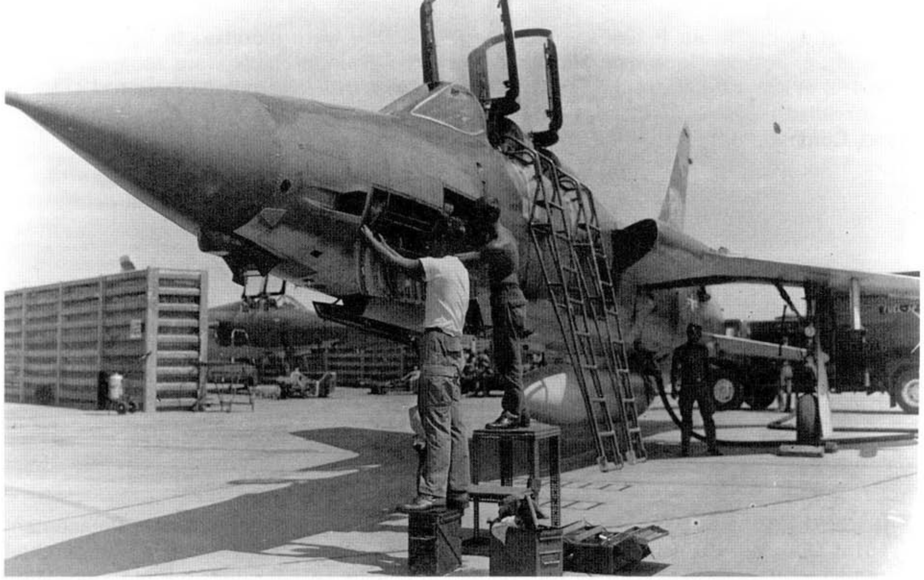




Two rows of 388th TFW F-105Ds line the dispersal area at Korat RTAB on 1 July 1968. The aircraft are preparing to take off armed with bombs on the outboard wing pylons. Several Thunderchiefs display variations in the Southeast Asia camouflage pattern, which happened when colors were applied in the wrong areas according to the F-105 camouflage Technical Order. (Cradle of Aviation Museum)

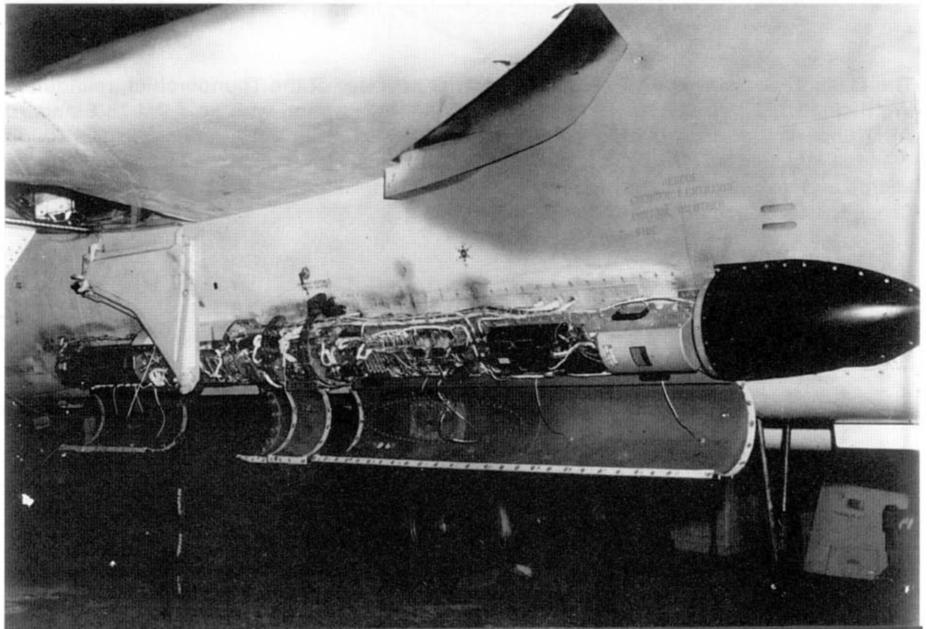
The F-105G was fitted with a Westinghouse AN/ALQ-105 ECM (Electronic Countermeasures) pod fitted to the lower fuselage sides. This pod was created by splitting the existing ALQ-101 pod in half. The aft portion of the pod was indented to allow clearance for the inboard main landing gear door. A 650 gallon fuel tank is installed along the aircraft's centerline. (Cradle of Aviation Museum)

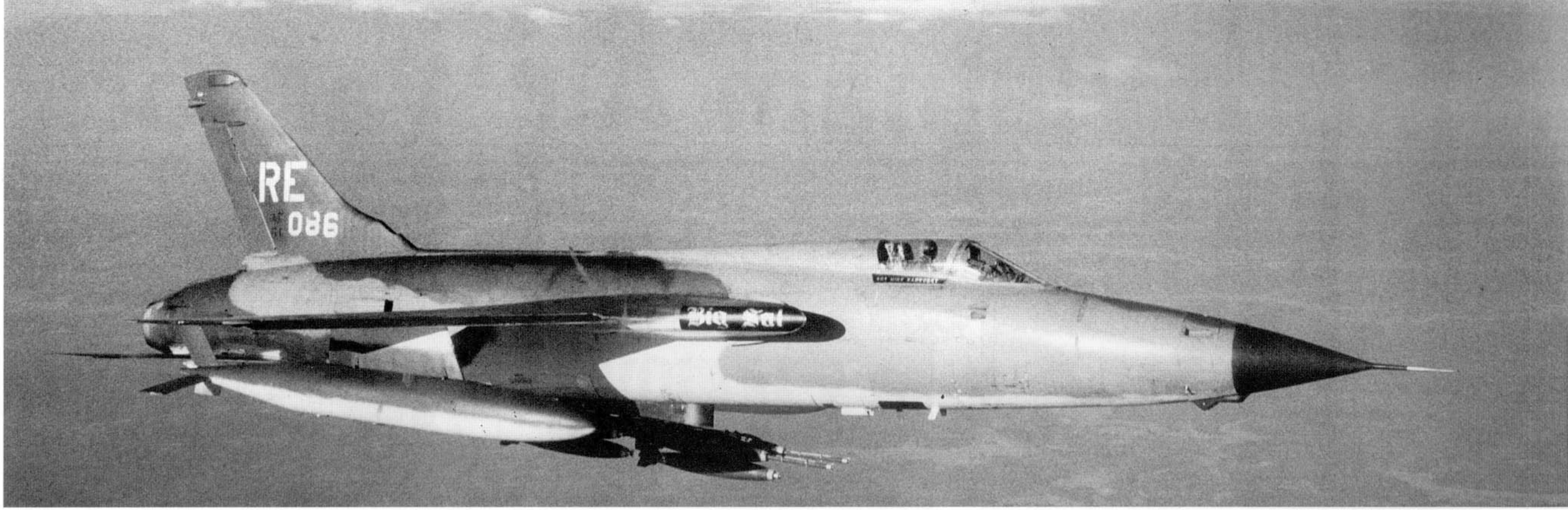




Ground crewman service the 20MM M-61A1 Vulcan cannon of an F-105F at Korat RTAB on 17 December 1968. One mechanic stands on an ammunition box to service the weapon's muzzle area, while his colleague maintains the cannon's breech. The F-105F is being refueled through the single point ground refueling receptacle on the lower port fuselage side. The fuel truck is parked behind the aircraft's tail. (Cradle of Aviation Museum)

The access panels for the AN/ALQ-105 ECM pod were hinged at the bottom for servicing. The extensive electronics equipment and wiring were fitted within the close confines of the pod. Installation of the AN/ALQ-105 pod along the fuselage sides kept the F-105G's five external stores pylons – two per wing and one centerline – free for fuel tanks and weapons. (Cradle of Aviation Museum)

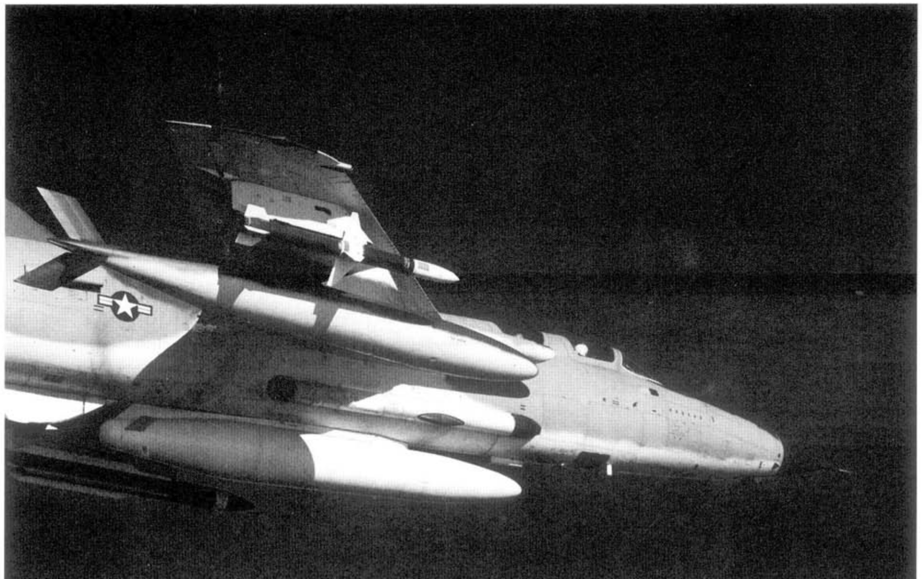




(Below) An F-105G carries an asymmetric external stores load while en route on a Wild Weasel mission over Southeast Asia on 5 May 1970. The Thunderchief is armed with an AGM-45 Shrike ARM on the outboard wing pylons, an AGM-78 Standard ARM on the port inboard wing pylon, and a 450 gallon fuel tank on the starboard inboard wing pylon. A 650 gallon fuel tank is mounted on the centerline and is flanked by the AN/ALQ-105 ECM pod. (US Air Force)

(Above) *Big Sal* (61-086) was an F-105D assigned to the 44th TFS, 355th TFW at Takhli RTAB, Thailand. This Thunderchief is en route to its target in Southeast Asia on 30 October 1968. The name is painted in white on a black panel on the engine intake. The crew chief's name is white on the black rectangle under the cockpit sill. The F-105D is armed with six 500 pound Mk 82 bombs; two of the bombs have fuse extenders to ensure detonation above the ground. (US Air Force)

(Below) Retired from service, F-105s are lined up at MASDC (Military Aircraft Storage and Disposition Center), located at Davis-Monthan AFB, Arizona during April of 1984. The 'TH' coded aircraft are Thunderstick II-equipped F-105Ds flown by the Air Force Reserve's 457th TFS at Carswell AFB, Texas. White latex covers the noses, canopies, and access panel lines of the aircraft to protect them from the desert sun. The last F-105 flight took place at Hill AFB, Utah on 25 February 1984. (Curtiss Knowles)



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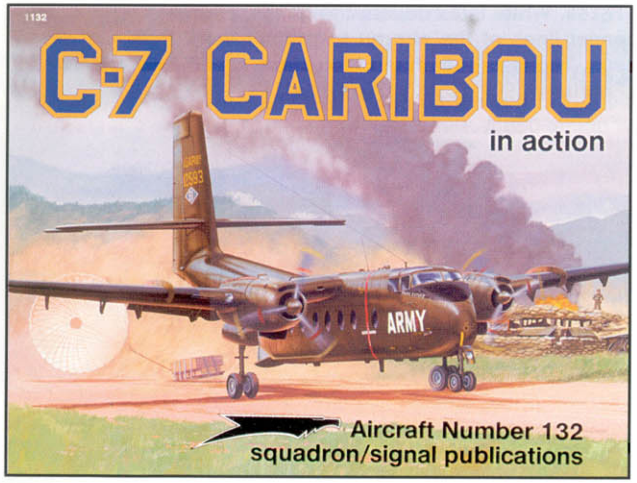
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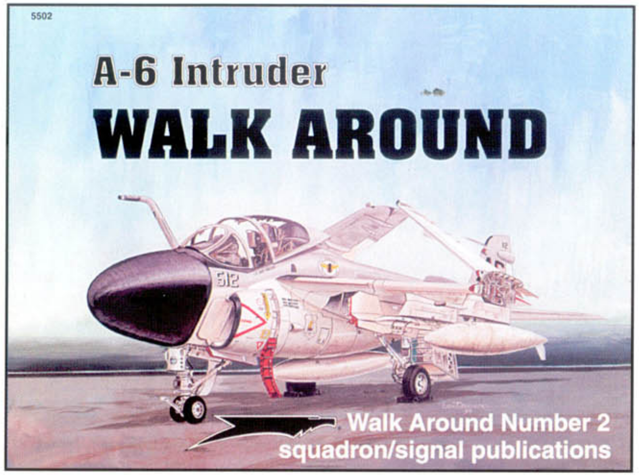
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